# Exercise in schizophrenia:
## Where are we and where do we go?


**Davy Vancampfort, PhD**

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KU Leuven Department of Neurosciences, Belgium

KU Leuven Department of Rehabilitation Sciences, Belgium


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Germany
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France
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Knokke-Heist
Oostende
Brugge
Turnhout
Antwerp
Herentals
St.-Niklaas
Gent
Dendermonde
Mechelen
Aarschot
Hasselt
Roeselare
Kortrijk
Leuven
Brussels
Tienen
St. Truiden
Mouscron
Ryinse
Halle
Wavre
Tournai
Ath
Soignies
Leuze
Liege
Verviers
Namur
Huy
Spa
Malmédy
Mons
Dinant
Marche en Famenne
Philippeville
Chimay
Bastogne
Neufchateau
Bouillon
Arlon
Luxembourg

I ♥ Belgium




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## Ouderen

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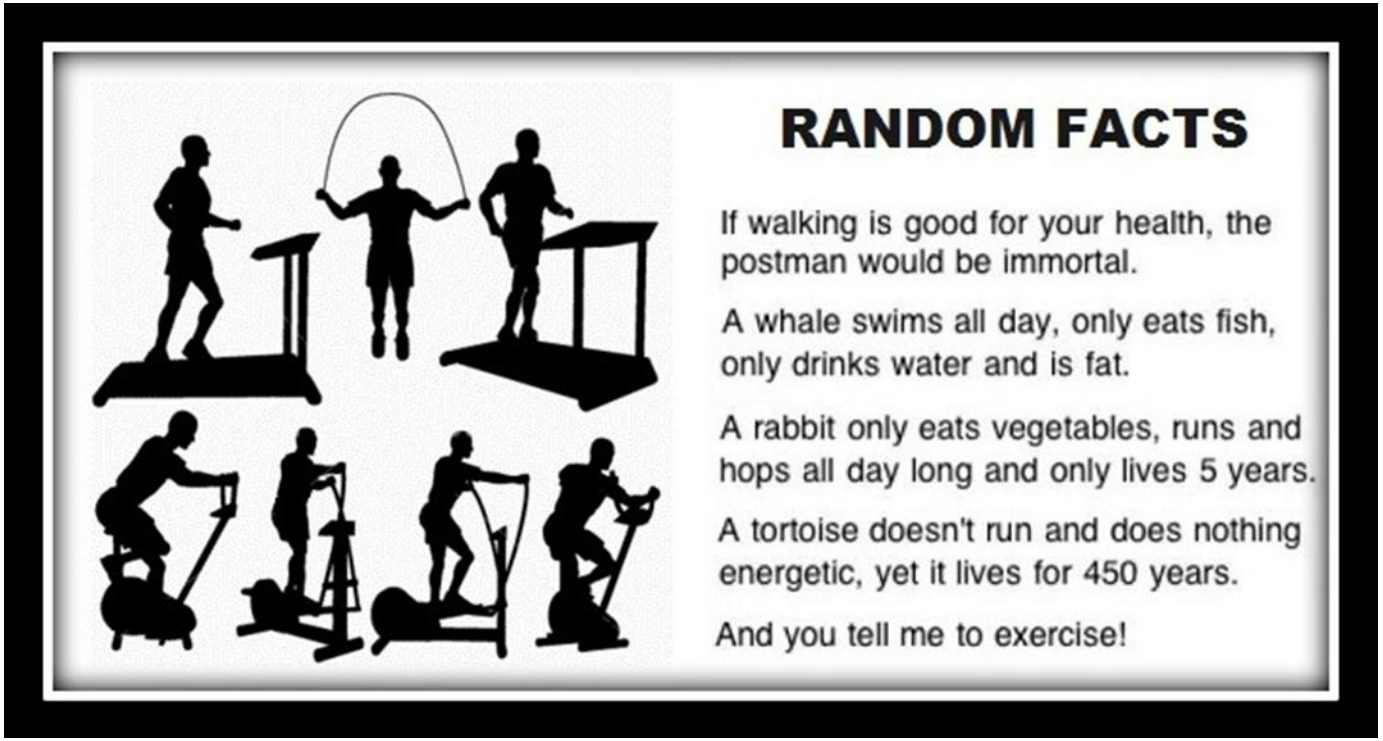
# Exercise in schizophrenia:

## from efficacy to effectiveness of physical activity interventions



# Should patients with schizophrenia be more physically active?

| | | |
|---|---|---|
| 15 | ● | $1 Million |
| 14 | ● | $500,000 |
| 13 | ● | $250,000 |
| 12 | ● | $125,000 |
| 11 | ● | $64,000 |
| 10 | ● | $32,000 |
| 9 | ● | $16,000 |
| 8 | ● | $8,000 |
| 7 | ● | $4,000 |
| 6 | ● | $2,000 |
| 5 | ● | $1,000 |
| 4 | ● | $500 |
| 3 | ● | $300 |
| 2 | ● | $200 |
| 1 | ● | $100 |

50:50

A: Yes, physical activity is healthy for all.

B: Yes, although the evidence for physical activity in schizophrenia still is limited.

C: Yes, but physical activity is complementary to pharmacotherapy and psychotherapy.

D: Yes and physical activity should be the cornerstone of the treatment.

# Evolution of the life expectancy in Denmark: general population versus schizophrenia

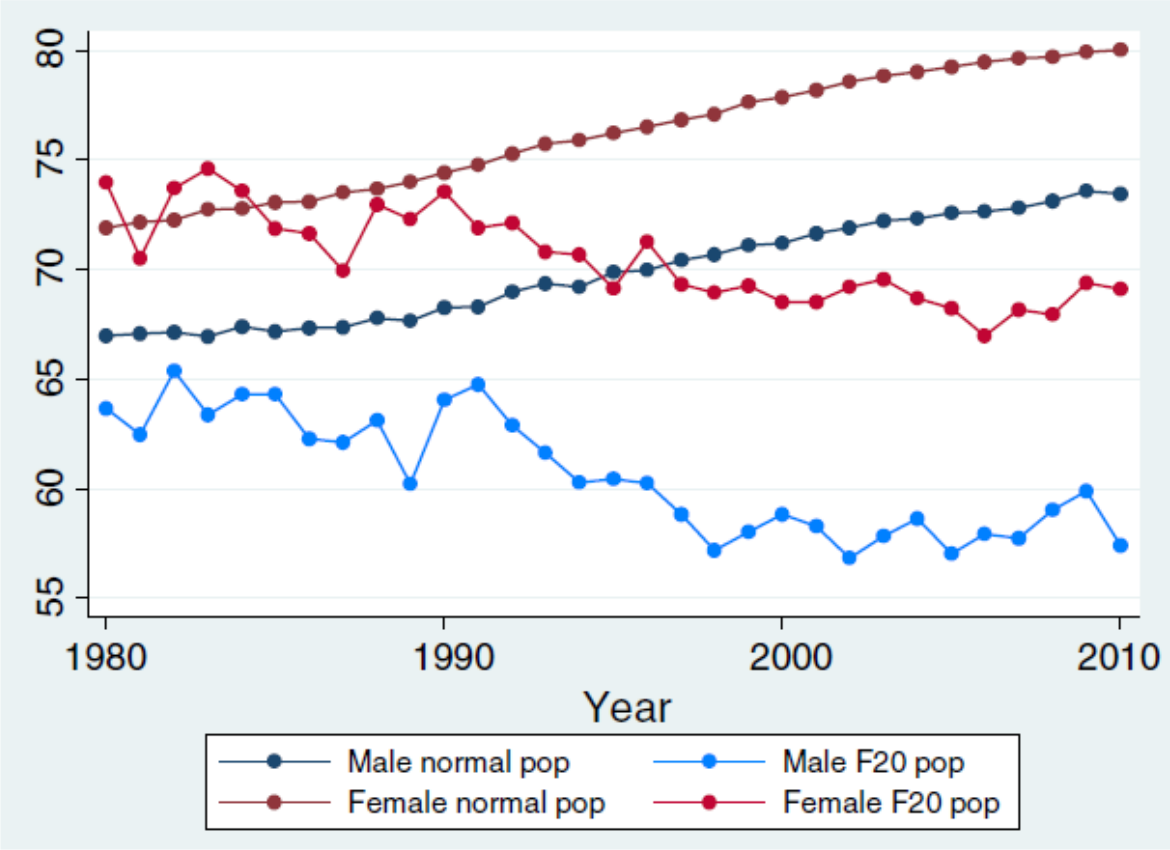



**Fig. 2.** Average age of death by year for the schizophrenia and general population over three decades with intentional self-harm excluded as cause of death.



Nielsen et al. Increasing mortality gap for patients diagnosed with schizophrenia over the last three decades--a Danish nationwide study from 1980 to 2010. Schiz Res 2013; 146(1-3):22-7

Original Investigation | META-ANALYSIS

# Mortality in Mental Disorders and Global Disease Burden Implications

## A Systematic Review and Meta-analysis

Elizabeth Reisinger Walker, PhD, MPH, MAT; Robin E. McGee, MPH; Benjamin G. Druss, MD, MPH

*JAMA Psychiatry*. 2015;72(4):334-341. doi:10.1001/jamapsychiatry.2014.2502
Published online February 11, 2015.

Table 2. Meta-analysis of Mental Disorders and Mortality

| Study Population | No. of Studies/ No. of RRs | RR (95% CI)[a] | $I^2$ Statistic, % |
|---|---|---|---|
| All-cause mortality | 148/149 | 2.22 (2.12-2.33) | 99.6 |
| Population of people with mental disorders | | | |
| Inpatient | 60/61 | 2.42 (2.24-2.61) | 99.6 |
| Outpatient or inpatient and outpatient | 38/38 | 2.08 (1.91-2.27) | 99.6 |
| Community | 28/28 | 1.90 (1.61-2.25) | 94.6 |
| First year of baseline | | | |
| Before 1970 | 26/26 | 1.79 (1.49-2.15) | 99.4 |
| 1970-1979 | 23/23 | 2.07 (1.86-2.31) | 99.4 |
| 1980-1989 | 28/28 | 2.28 (2.07-2.50) | 99.3 |
| 1990-1999 | 50/50 | 2.43 (2.24-2.63) | 99.6 |
| 2000 and later | 19/19 | 2.47 (2.17-2.79) | 99.2 |
| Method used to assess mental disorder | | | |
| Diagnostic interview | 42/42 | 1.88 (1.69-2.11) | 92.2 |
| Diagnosis in records | 90/91 | 2.36 (2.23-2.51) | 99.8 |
| Years of follow-up | | | |
| ≤10 | 78/78 | 2.43 (2.25-2.64) | 99.5 |
| >10 | 70/71 | 2.03 (1.89-2.18) | 99.7 |
| All-cause mortality by specific diagnosis | | | |
| Psychoses | 65/66 | 2.54 (2.35-2.75) | 99.0 |
| Mood disorders[b] | 16/16 | 2.08 (1.89-2.30) | 97.3 |
| Depression[b] | 43/43 | 1.71 (1.54-1.90) | 99.4 |
| Bipolar disorder[b] | 19/19 | 2.00 (1.70-2.34) | 99.1 |
| Anxiety | 29/29 | 1.43 (1.24-1.64) | 98.8 |
| Cause-specific mortality | | | |
| Natural | 100/100 | 1.80 (1.71-1.88) | 99.3 |
| Unnatural | 106/106 | 7.22 (6.43-8.12) | 99.5 |

Article

# Comorbidities and Mortality in Persons With Schizophrenia: A Swedish National Cohort Study

Casey Crump, M.D., Ph.D.

Marilyn A. Winkleby, Ph.D.

Kristina Sundquist, M.D., Ph.D.

Jan Sundquist, M.D., Ph.D.

**Objective:** Schizophrenia is associated with premature mortality, but the specific causes and pathways are unclear. The authors used outpatient and inpatient data for a national population to examine the association between schizophrenia and mortality and comorbidities.

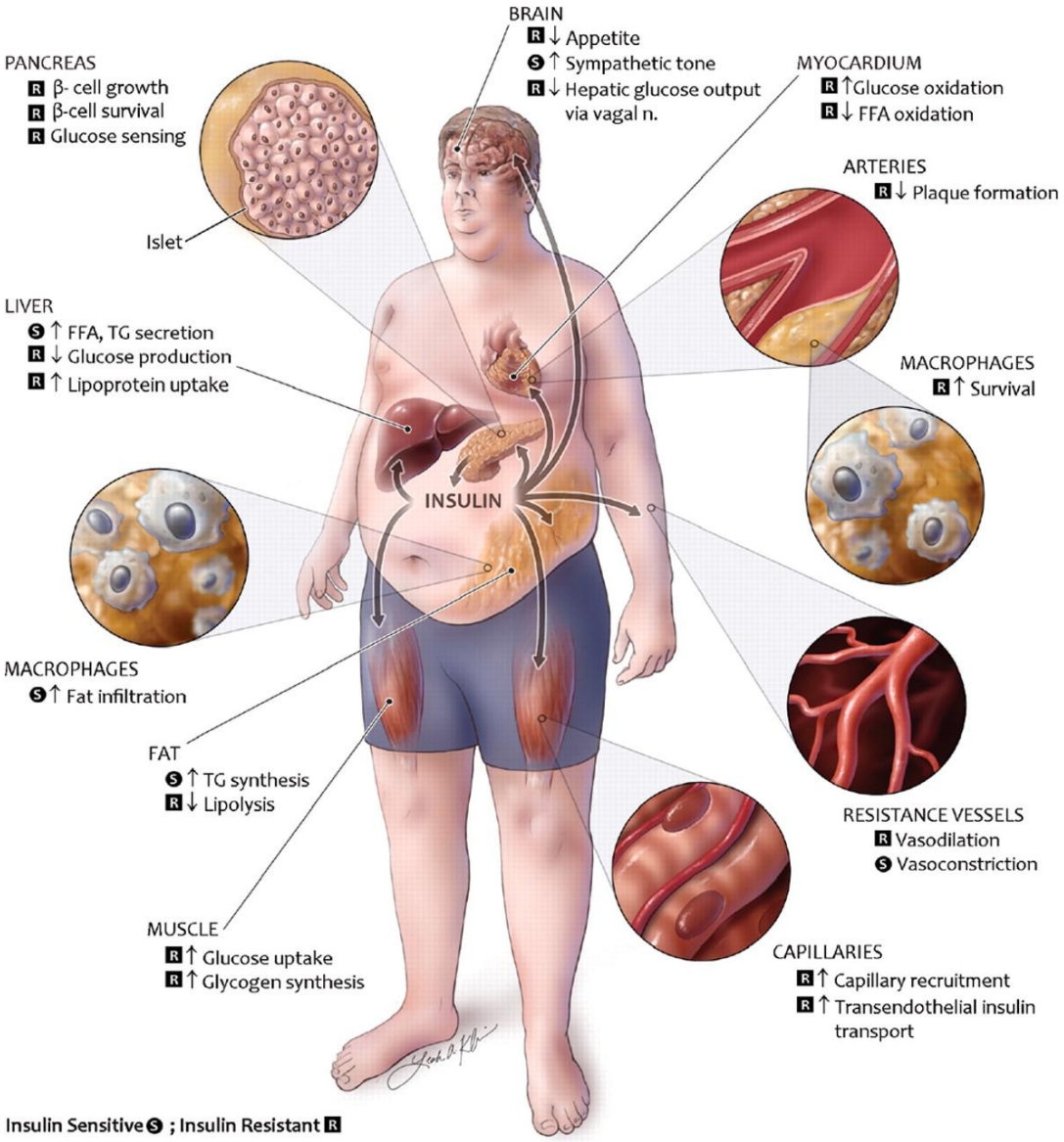
**Method:** This was a national cohort study of 6,097,834 Swedish adults, including 8,277 with schizophrenia, followed for 7 years (2003–2009) for mortality and comorbidities diagnosed in any outpatient or inpatient setting nationwide.

**Results:** On average, men with schizophrenia died 15 years earlier, and women 12 years earlier, than the rest of the population, and this was not accounted for by unnatural deaths. The leading causes were ischemic heart disease and cancer. Despite having twice as many health care system contacts, schizophrenia patients had no increased risk of nonfatal ischemic heart disease or cancer diagnoses, but they had an elevated mortality from ischemic heart disease (adjusted hazard ratio for women, 3.33 [95% CI=2.73–4.05]; for men, 2.20 [95% CI=1.83–2.65]) and cancer (adjusted hazard ratio for women, 1.71 [95% CI=1.38–2.10; for men, 1.44 [95% CI=1.15–1.80]). Among all people who died from ischemic heart disease or cancer, schizophrenia patients were less likely than others to have been diagnosed previously with these conditions (for ischemic heart disease, 26.3% compared with 43.7%; for cancer, 73.9% compared with 82.3%). The association between schizophrenia and mortality was stronger among women and the employed. Lack of antipsychotic treatment was also associated with elevated mortality.

**Conclusions:** Schizophrenia patients had markedly premature mortality, and the leading causes were ischemic heart disease and cancer, which appeared to be underdiagnosed. Preventive interventions should prioritize primary health care tailored to this population, including more effective risk modification and screening for cardiovascular disease and cancer.

*(Am J Psychiatry 2013; 170:324–333)*

# The metabolic syndrome and diabetes are important risk factors



# Metabolic syndrome

Under Review

Risk of Metabolic Syndrome and its Components in People with Schizophrenia, Bipolar and Major Depressive Disorders: a Large Scale Meta-analysis of 198 Studies

Original Investigation: Meta-analysis

Davy Vancampfort (University Psychiatric Centre KU Leuven, campus Kortenberg, KULeuven Department of Neurosciences)

Davy Vancampfort (corr_auth) , Brendon Stubbs , Alex Mitchell , Marc De Hert , Martien Wampers , Philip Ward , Simon Rosenbaum , Christoph Correll

'There was no funding.'

Importance. People with severe mental illness (SMI), defined as schizophrenia, bipolar disorder (BD) and major depressive disorder (MDD), have 2-3 times higher mortality than the general population, mainly due to cardiovascular diseases (CVD). Metabolic syndrome (MetS) and its components are highly predictive of CVD.

Objective. (1) To describe pooled frequencies of MetS and its components in people with SMI, taking into account demographic and diagnostic variations and psychotropic medication use. (2) To compare MetS prevalences in SMIs versus the general population.

Data Sources. Medline, PsycARTICLES, Embase and CINAHL were searched until 11/31/2014.

Study Selection. We included cross-sectional and baseline data of longitudinal studies in adults with schizophrenia, related psychoses, BD or MDD.

Data Extraction and Synthesis. Two independent reviewers extracted data. The DerSimonian-Laird proportion method, including random effects meta-analysis, relative risk analyses, subgroup and meta-regression analyses were employed.

Main Outcome Measures. Pooled prevalence of MetS and its components.

Results. The pooled MetS prevalence was 32.6% (95%CI=30.8%-34.4%; N=198; n=52,678; age range= 22.2-73.2years, illness duration=0-30years). There were no significant diagnostic subgroup differences. Highest MetS prevalences were observed in Australia (50.2%; 95%CI=32.9%-67.4%). Older age and a higher body mass index were significant moderators in the final demographic regression model ($z=-3.6$, $p=0.0003$, $r^2=0.19$). All individual antipsychotic medications had a significantly ($p<0.001$) higher MetS risk compared to antipsychotic-naïve participants with odds ratios (OR) ranging from 3.25 (95%CI=2.36-4.49) for aripiprazole to 7.81 (95%CI=6.02-10.22) for clozapine. MetS risk was significantly higher with clozapine and olanzapine (except vs. clozapine) than other antipsychotics, and significantly lower with aripiprazole than other antipsychotics (except vs. amisulpride). Compared with matched general population controls, people with SMI had a significantly ($p<0.001$) increased risk for MetS (RR=1.58; 95%CI=1.35-1.86; $p<0.001$), and all its components, except for hypertension ($p=0.07$). Significantly higher MetS risk compared to the general population ($p<0.001$) was present for people with schizophrenia (1.87; 95%CI=1.53-2.29), BD (1.58; 95%CI=1.24-2.03) and MDD (RR=1.57; 95%CI=1.38-1.79).

Conclusions and Relevance. MetS prevalences were consistently and similarly elevated in each of the three major diagnostic subgroups. Routine screening and multidisciplinary management of medical and behavioral conditions is needed. Risks of individual antipsychotics should be considered when making treatment choices.

# Metabolic syndrome

- Comparing MetS in first versus multi-episode patients within illness subgroups, first episode psychosis patients (**13.7%**; 95% CI=10.4%-16.9%; Q=8.659, p= 0.034; N=4; n=424) had significantly lower MetS than those with multi-episode schizophrenia (**34.2%**; 95%CI=30.8%-36.0%; Q=1,955, P<0.001; N=105; n=29,596) (z=-8.9, p<0.001).

- Although mean age predicted MetS prevalence (co-efficient=0.0296; 95% 0.013 to 0.0463; z=3.49, p=0.005) first episode was also a unique predictor of lower MetS (co-efficient=-0.7517; 95% CI-1.4877 to-0.0157; z=-2, p=0.04; $r^2$=0.24).

Acta Psychiatrica Scandinavica

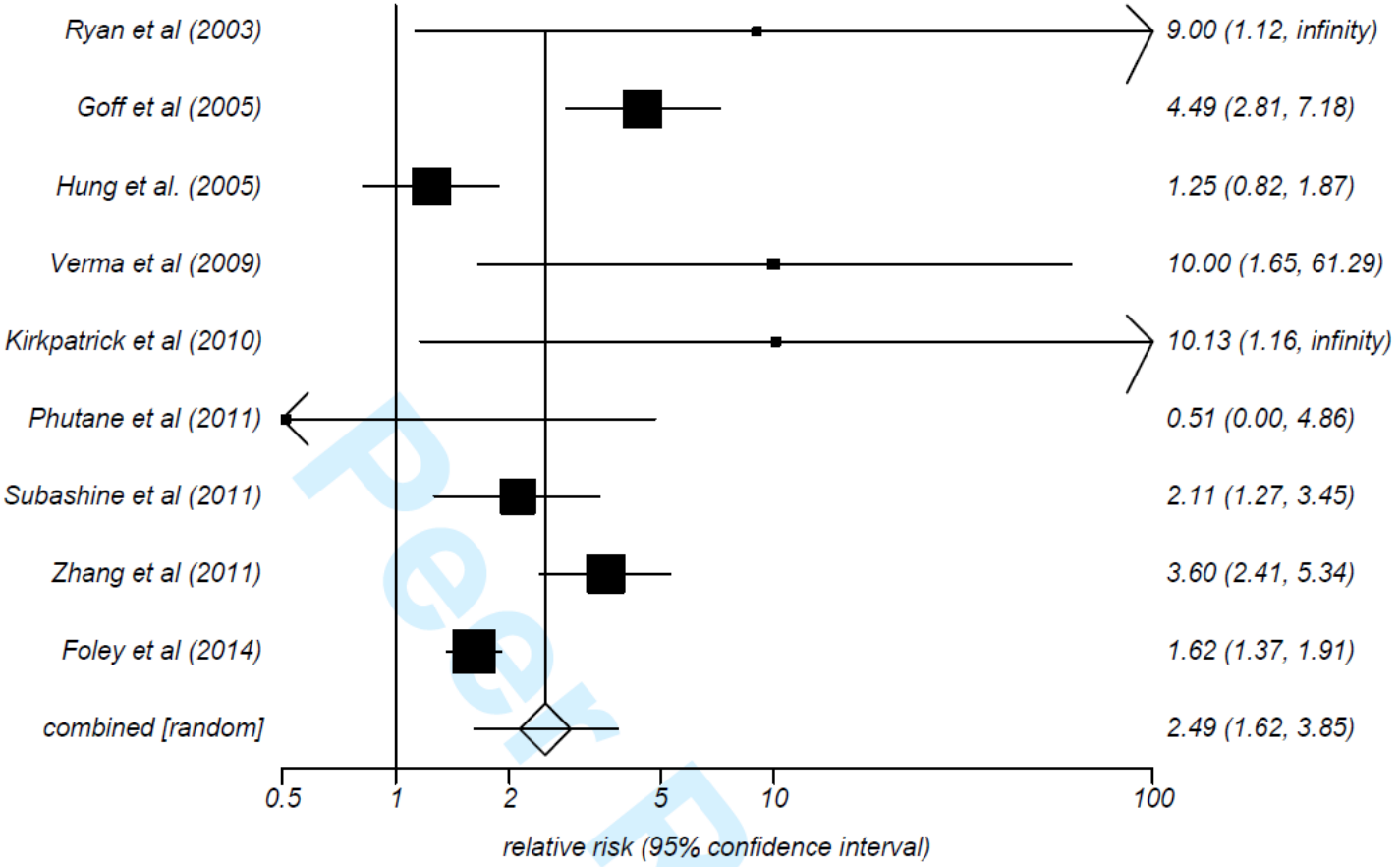
# The prevalence and predictors of diabetes mellitus in schizophrenia: A systematic review and comparative meta-analysis



| | |
|---|---|
| Journal: | *Acta Psychiatrica Scandinavica* |
| Manuscript ID: | ACP-2015-4911.R1 |
| Manuscript Type: | Review of the literature |
| Date Submitted by the Author: | 08-Apr-2015 |
| Complete List of Authors: | Stubbs, Brendon; Greenwich, Health and Social Care;<br>Vancampfort, Davy; KU Leuven, Rehabilitation Sciences<br>De Hert, Marc; UPC KU Leuven, Psychiatry<br>Mitchell, Alex; University of Leicester, Psychiatry |
| Keywords: | Diabetes Mellitus, Physical health, Physical illness |
| | |

# Diabetes type 2

Relative risk meta-analysis plot (random effects)



# What are the reasons for the high risk of cardiometabolic diseases in schizophrenia?


| | | |
|---|---|---|
| 15 | ● | $1 Million |
| 14 | ● | $500,000 |
| 13 | ● | $250,000 |
| 12 | ● | $125,000 |
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| 2 | ● | $200 |
| 1 | ● | $100 |

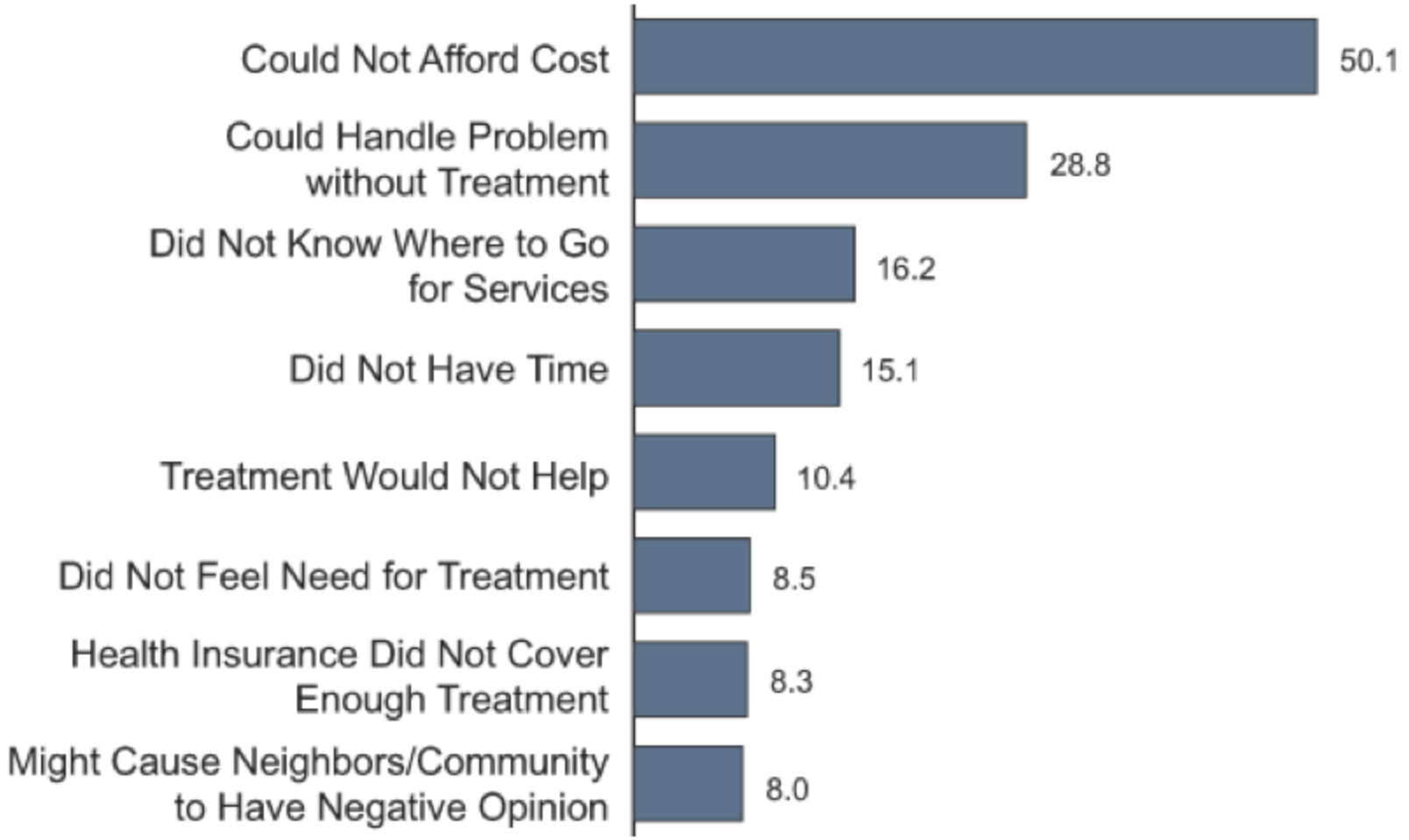

De Hert M, et al. Physical illness in patients with severe mental disorders. II. Barriers to care, monitoring and treatment guidelines, and recommendations at the system and individual levels. World Psychiatry. 2011;10(2):138-151.

# Odds ratios° for metabolic syndrome risk for individual antipsychotic medications (if mono-therapy and N≥5)

| Medication | Antipsychotic-naïve |
|---|---|
| Amisulpride (AMI) | **AMI ↑**<br>3.86* (2.54-5.84); N=15 ; n=999 |
| Aripiprazole (ARI) | **ARI ↑**<br>3.25** (2.36-4.49); N=16 ; n=1,319 |
| Clozapine (CLO) | **CLO ↑**<br>7.81** (6.02-10.22); N=17 ; n=2,398 |
| Olanzapine (OLA) | **OLA ↑**<br>5.87** (4.53-7.67); N=22 ; n=2,633 |
| Quetiapine (QUE) | **QUE ↑**<br>5.14** (3.75-7.07); N=21; n=1,266 |
| Risperidone (RIS) | **RIS ↑**<br>4.57** (3.48-6.03); N=30 ; n=2,025 |
| Typical antipsychotic (Typical) | **Typical ↑**<br>4.97** (3.83-6.51); N=17 ; n=2,525 |

Data presented as odds ratios (exact Fisher 95% confidence interval): medication row versus medication column; *two-sided p<0.01, **two-sided p<0.001; °odds ratios are not age-adjusted as too few studies provided mean ages for individual antipsychotic groups: mean pooled age (years) (if present): antipsychotic-naïve=31 years; AMI=27 years; ARI=24 years; CLO=37 years; OLA=33 years; QUE=31 years; RIS=30 years; Typical=33 years; N= number of included studies in the analyses, n= number of included participants in the analyses; ↑= higher risk, ↓=lower risk, ↔= no significant risk difference.


De Hert M, et al. Physical illness in patients with severe mental disorders. II. Barriers to care, monitoring and treatment guidelines, and recommendations at the system and individual levels. World Psychiatry. 2011;10(2):138-151.



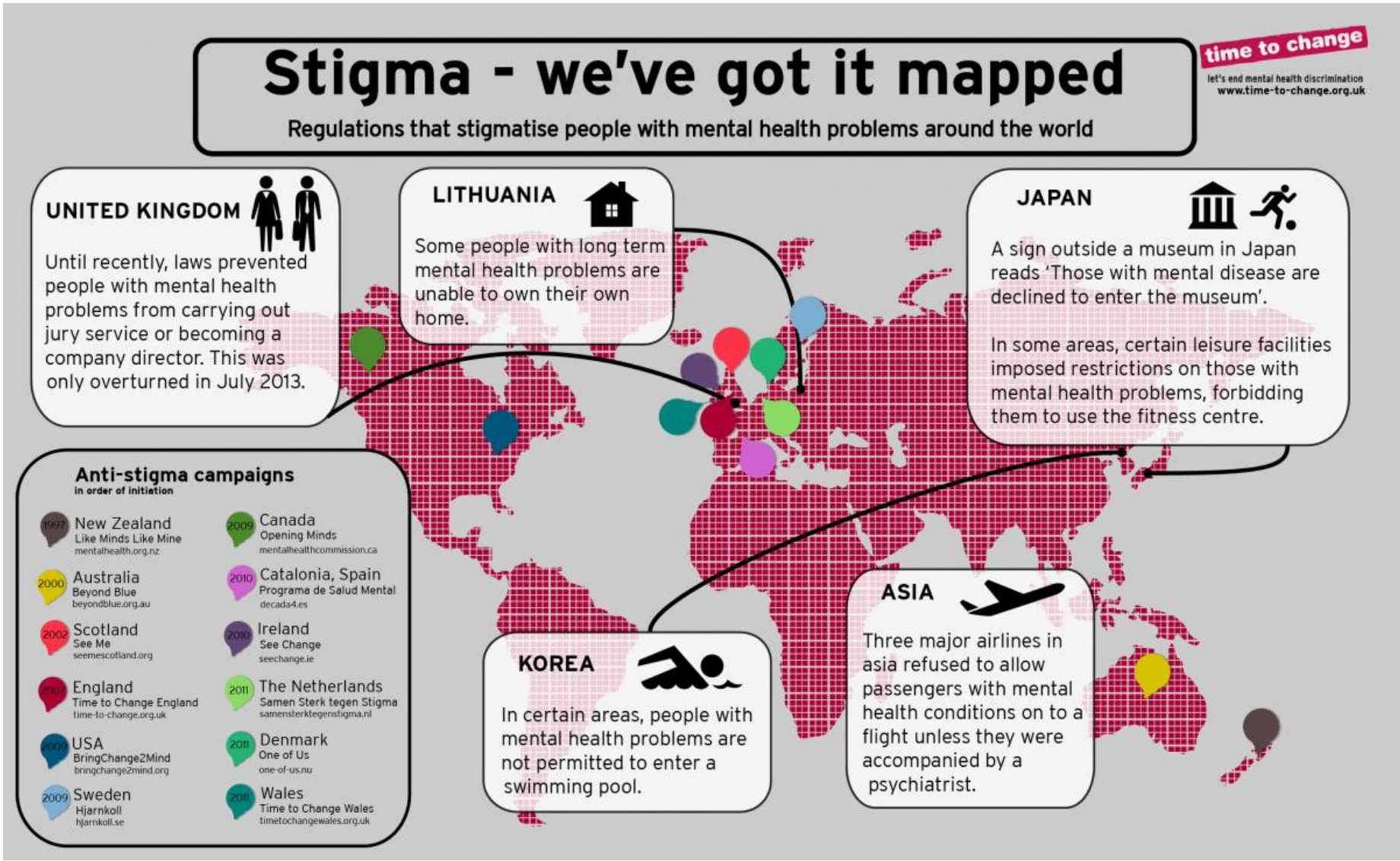

Based on the percentage of adults with mental illness who did not receive any treatment in 2011. Results from: Substance Abuse and Mental Health Services Administration: *Results from the 2011 National Survey on Drug Use and Health: Mental Health Findings*, NSDUH Series H-45, HHS Publication No. (SMA) 12-4725. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2012.


De Hert M, et al. Physical illness in patients with severe mental disorders. II. Barriers to care, monitoring and treatment guidelines, and recommendations at the system and individual levels. World Psychiatry. 2011;10(2):138-151.

# Stigma - we've got it mapped

Regulations that stigmatise people with mental health problems around the world

time to change
let's end mental health discrimination
www.time-to-change.org.uk



## UNITED KINGDOM

Until recently, laws prevented people with mental health problems from carrying out jury service or becoming a company director. This was only overturned in July 2013.

## LITHUANIA

Some people with long term mental health problems are unable to own their own home.

## JAPAN

A sign outside a museum in Japan reads 'Those with mental disease are declined to enter the museum'.

In some areas, certain leisure facilities imposed restrictions on those with mental health problems, forbidding them to use the fitness centre.

## KOREA

In certain areas, people with mental health problems are not permitted to enter a swimming pool.

## ASIA

Three major airlines in asia refused to allow passengers with mental health conditions on to a flight unless they were accompanied by a psychiatrist.

## Anti-stigma campaigns

in order of initiation

- 1997 New Zealand — Like Minds Like Mine — mentalhealth.org.nz
- 2000 Australia — Beyond Blue — beyondblue.org.au
- 2002 Scotland — See Me — seemescotland.org
- 2007 England — Time to Change England — time-to-change.org.uk
- 2009 USA — BringChange2Mind — bringchange2mind.org
- 2009 Sweden — Hjarnkoll — hjarnkoll.se
- 2009 Canada — Opening Minds — mentalhealthcommission.ca
- 2010 Catalonia, Spain — Programa de Salud Mental — decada4.es
- 2010 Ireland — See Change — seechange.ie
- 2011 The Netherlands — Samen Sterk tegen Stigma — samensterktegenstigma.nl
- 2011 Denmark — One of Us — one-of-us.nu
- 2011 Wales — Time to Change Wales — timetochangewales.org.uk

*Article*

Asia-Pacific Journal of Public Health
2015, Vol. 27(2) NP1932–NP1941

DOI: 10.1177/1010539512469246
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# Relationships Between Perceived Stigma, Coping Orientations, Self-esteem, and Quality of Life in Patients With Schizophrenia

**Chien-Yi Ow, BA (Hons)[1] and Boon-Ooi Lee, PhD[2]**

## Abstract

Stigmatization of mental disorders has detrimental consequences for psychiatric patients. This study examined how perceived stigma and coping orientations of secrecy, withdrawal, and education were related to schizophrenic patients' self-esteem and quality of life (QOL). Coping orientations as mediators of perceived stigma on the outcome variables were also investigated. A total of 80 schizophrenic patients in Singapore participated in the study. Results show that perceived stigma predicted self-esteem over and above gender and depression, perceived stigma and education predicted QOL over and above depression, and education partially mediated the effect of perceived stigma on QOL. Findings indicate that stigma perceptions and education coping are important focus areas in clinical interventions.

## Keywords

coping, quality of life, schizophrenia, self-esteem, Singapore, stigma

# Guideline concordant monitoring of metabolic risk in people treated with antipsychotic medication: systematic review and meta-analysis of screening practices

A. J. Mitchell, V. Delaffon, D. Vancampfort, C. U. Correll and M. De Hert

Psychological Medicine / *FirstView* Article / August 2012, pp 1 - 23
DOI: 10.1017/S003329171100105X, Published online: 10 August 2011

**Table 2.** *Meta-analytic pooled rates of metabolic monitoring before and after guideline implementation*

| | Baseline studies | | Post-guideline studies | | |
|---|---|---|---|---|---|
| | Rate of testing | Heterogeneity ($I^2$ inconsistency) Publication bias (Begg–Mazumdar test) | Rate of testing | Heterogeneity ($I^2$ inconsistency) Publication bias (Begg–Mazumdar test) | Pre-post pooled change (%) |
| Weight monitoring | 47.9 (32.4–63.67) $n=19$ [inadequate] | 99.6 (99.6–99.6) Kendall's $\tau=0.06$, $p=0.73$ | 75.9 (37.3–98.7) $n=3$ [adequate] | 99.7 (99.7–99.7) Kendall's $\tau$ Insufficient data | 28.0 |
| Blood pressure monitoring | 69.8 (50.9–85.8) $n=14$ [suboptimal] | 99.7 (99.7–99.7) Kendall's $\tau=-0.1$, $p=0.6$ | 75.2 (45.6–95.5) $n=3$ [adequate] | 99.5 (99.4–99.6) Kendall's $\tau$ Insufficient data | 5.4 |
| Glucose monitoring | 44.3 (36.3–52.4) $n=30$ [inadequate] | 99.9 (99.9–99.9) Kendall's $\tau=0.02$, $p=0.9$ | 56.1 (43.4–68.3) $n=7$ [suboptimal] | 99.8 (99.8–99.8 %) Kendall's $\tau=0.2$, $p=0.6$ | 11.8 |
| Lipid monitoring | 22.2 (16.4–28.7) $n=23$ [inadequate] | 99.8 (99.8–99.9) Kendall's $\tau=0.1$, $p=0.5$ | 37.2 (23.7–51.9) $n=7$ [inadequate] | 99.8 (99.8–99.8) Kendall's $\tau=0.5$, $p=0.3$ | 15.0 |
| Cholesterol monitoring | 41.5 (18.0–67.3) $n=7$ [inadequate] | 99.5 (99.5–99.6) Kendall's $\tau=0.1$, $p=0.8$ | Insufficient data | Insufficient data | N.A. |
| Triglyceride testing | 59.9 (36.6–81.1) $n=5$ [suboptimal] | 98.9 (98.6–99.1) Kendall's $\tau=-0.2$, $p=0.5$ | Insufficient data | Insufficient data | N.A. |
| HbA1c screening | 16.0 (7.5–26.9) $n=10$ [inadequate] | 99.5 (99.5–99.6) Kendall's $\tau=0.02$, $p>0.9$ | Insufficient data | Insufficient data | N.A. |

N.A., Not available.

Rates and heterogeneity given as percentage (95% confidence interval).

Grade of monitoring according to the following: <50% as 'inadequate', ⩾50% as 'suboptimal', ⩾70% monitored as 'adequate', ⩾80% as 'good' and ⩾90% as optimal.


De Hert M, et al. Physical illness in patients with severe mental disorders. II. Barriers to care, monitoring and treatment guidelines, and recommendations at the system and individual levels. World Psychiatry. 2011;10(2):138-151.

*PERSPECTIVE*

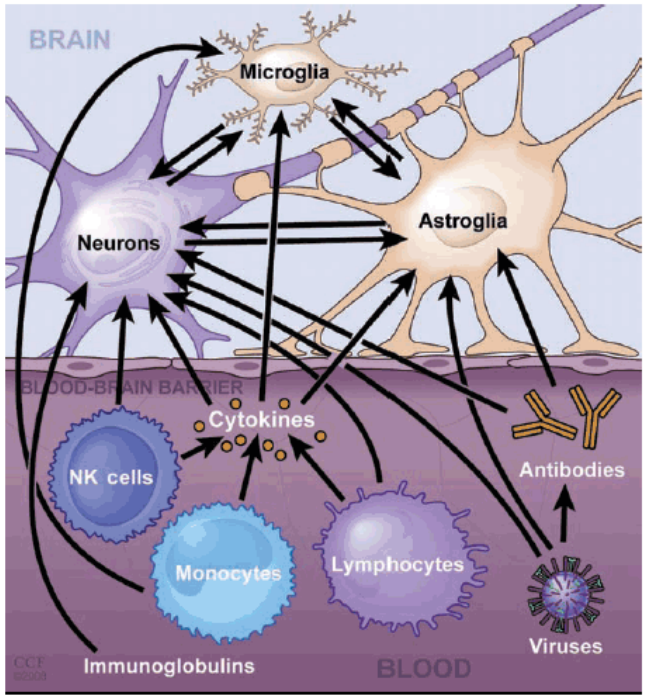
# Markers of inflammation in schizophrenia: association vs. causation

Peter Manu[1-3], Christoph U. Correll[1-3], Martien Wampers[4], Alex J. Mitchell[5,6], Michel Probst[4,7], Davy Vancampfort[4,7], Marc De Hert[4]

[1]Zucker Hillside Hospital, Glen Oaks, New York, NY, USA; [2]Albert Einstein College of Medicine, Bronx, NY, USA; [3]Hofstra North Shore – LIJ School of Medicine, Hempstead, NY, USA; [4]University Psychiatric Centre KU Leuven, Campus Kortenberg, Kortenberg, Belgium; [5]Department of Psycho-oncology, Leicestershire Partnership NHS Trust, Leicester, UK; [6]Department of Cancer and Molecular Medicine, University of Leicester, Leicester, UK; [7]KU Leuven Department of Rehabilitation Sciences, Leuven, Belgium

World Psychiatry 13:2 - June 2014

Figure 1 **Interaction between the immune system and schizophrenia**




Different immune reactions directly influence neuronal proliferation, differentiation, migration, and apoptosis. Microglia become activated after stress, trauma, or infection. They react with tissue repair or induction of immune responses: phagocytosis, secretion of cytokines, neuronal growth factors, and antigen presentation. Microglial activation may sustain chronic brain inflammation.[2]
NK, natural killer.


De Hert M, et al. Physical illness in patients with severe mental disorders. II. Barriers to care, monitoring and treatment guidelines, and recommendations at the system and individual levels. World Psychiatry. 2011;10(2):138-151.

# Physical activity and sedentary behaviour in outpatients with schizophrenia: A systematic review and meta-analysis

*Andrew Soundy, Martien Wampers, Michel Probst, Marc De Hert, Brendon Stubbs, Davy Vancampfort*

***Aims:*** *To identify, appraise and synthesise evidence on the level of physical inactivity or activity and its moderators in outpatients with schizophrenia.*
***Method:*** *A systematic search strategy was undertaken and included eight electronic databases. Searches were undertaken using a subject and text-word search strategy between the dates from each databases' inception to September 2012. Two independent reviewers determined study eligibility. Data extraction detailed the level and time spent in physical activity.*
***Results:*** *One hundred and sixty three records were screened, and 12 studies (n=628) met the inclusion criteria. A meta-analysis identified higher levels of sedentary activity (N=2; n=140; z=44.1; P<0.001) and low categories of physical activity (N=2; n=140; z=147,306; P<0.001), and lower levels of moderate (N=3; n=300; z=-5.1; P<0.001) and vigorous (n=3; n=220; z=-3.2; P=0.001) physical activity categories when comparing patients with schizophrenia to healthy age- and gender-matched controls. Meta-regression found no significant association between moderate and vigorous physical activity with age (P=0.08; P=0.14 respectively) and gender (P=0.08; P=0.14 respectively) as the moderators.*
***Conclusion:*** *The current study is the first to provide meta-analytic evidence for the sedentary behaviour and lack of physical activity in outpatients with schizophrenia.*

International Journal of Therapy and Rehabilitation, December 2013, Vol 20, No 12

**While in the general population almost 50% does not comply with the physical activity guidelines in patients with schizophrenia more than 75% is not physically active enough.**

# What are the reasons for this high risk for cardiometabolic diseases?


| | | |
|---|---|---|
| 15 | ● | $1 Million |
| 14 | ● | $500,000 |
| 13 | ● | $250,000 |
| 12 | ● | $125,000 |
| 11 | ● | $64,000 |
| 10 | ● | $32,000 |
| 9 | ● | $16,000 |
| 8 | ● | $8,000 |
| 7 | ● | $4,000 |
| 6 | ● | $2,000 |
| 5 | ● | $1,000 |
| 4 | ● | $500 |
| 3 | ● | $300 |
| 2 | ● | $200 |
| 1 | ● | $100 |

## ENVIRONMENTAL FACTORS

## IATROGENIC FACTORS


## INHERENT FACTORS

# “The heart truth”

# Should patients with schizophrenia be more physically active?

| | | |
|---|---|---|
| 15 | ● | $1 Million |
| 14 | ● | $500,000 |
| 13 | ● | $250,000 |
| 12 | ● | $125,000 |
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| 5 | ● | $1,000 |
| 4 | ● | $500 |
| 3 | ● | $300 |
| 2 | ● | $200 |
| 1 | ● | $100 |

50:50

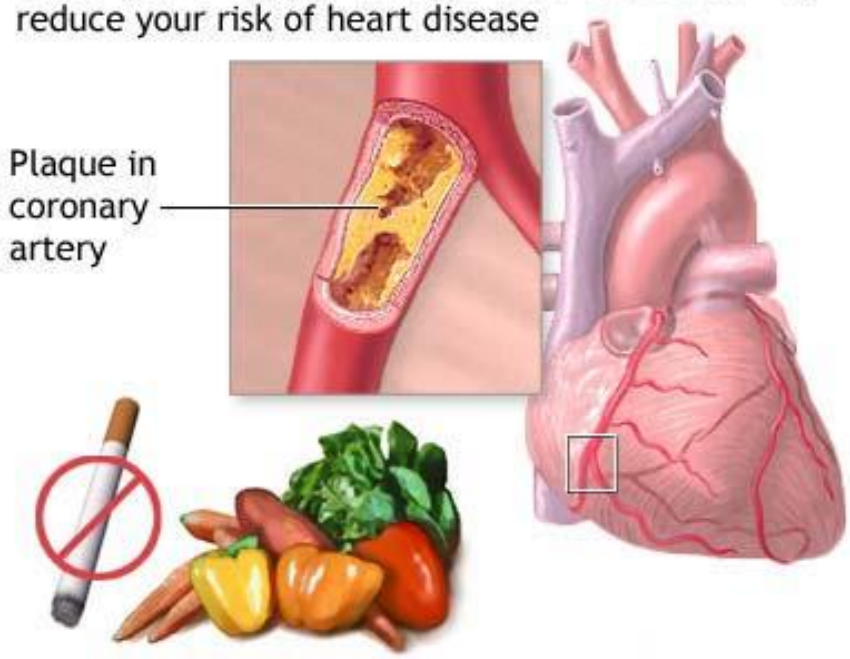
A: Yes, physical activity is healthy for all.

B: Yes, although the evidence for physical activity in schizophrenia still is limited.

C: Yes, but physical activity is complementary to pharmacotherapy and psychotherapy.

D: Yes and physical activity should be the cornerstone of the treatment.

Quitting smoking, a healthy diet and exercise may reduce your risk of heart disease



# A Meta-Review of Lifestyle Interventions for Cardiovascular Risk Factors in the General Medical Population: Lessons for Individuals With Serious Mental Illness

(Early Career Psychiatrists)

Martha C. Ward, DeJuan T. White, and Benjamin G. Druss

J Clin Psychiatry 2015;76(4):e477–e486 doi:10.4088/JCP.13r08657 

Objective: Individuals with serious mental illness die years younger than members of the general population, with cardiovascular disease and related risk factors accounting for the majority of deaths. Lifestyle interventions targeting these risk factors have begun to be developed for those with serious mental illness, but they have largely been created de novo rather than with information from work already done in the general population. This review aims to synthesize for a mental health audience the common factors for success in nonpharmacologic lifestyle interventions and identify specific considerations in adapting these models for those with serious mental illness.

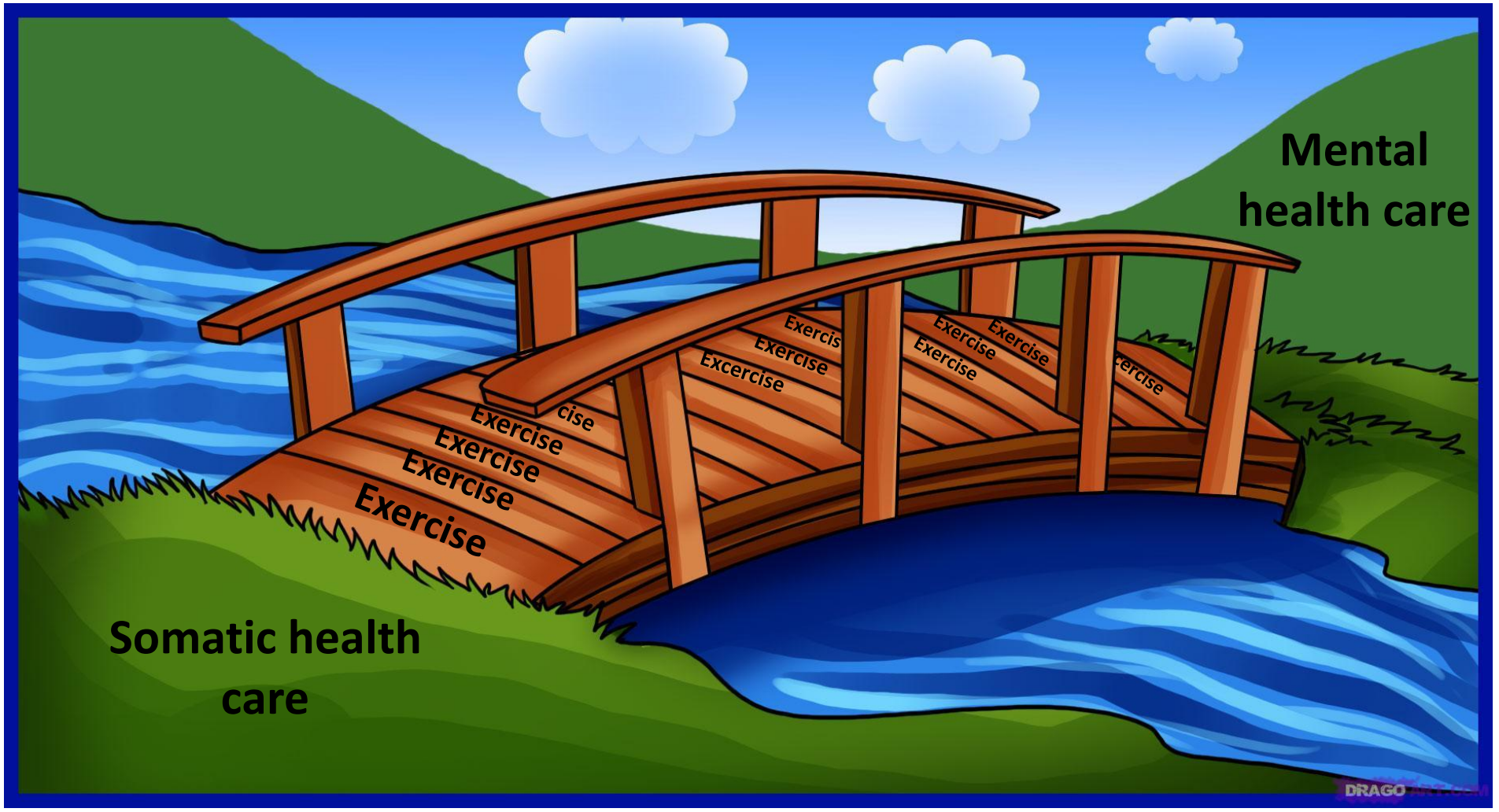
Data Sources: We searched the PubMed and Cochrane databases for English-language reviews from 2003 to 2013. The search employed combinations of the following terms: diabetes, diabetes mellitus, hypertension, hyperlipidemia, dyslipidemia, obesity, mental illness, schizophrenia, psychosis, bipolar disorder, lifestyle intervention, non-pharmacologic intervention, lifestyle modification, and weight gain.

Study Selection: We identified 8,147 review articles from the PubMed and Cochrane databases. 123 articles were selected. The selected articles were reviews of dietary, behavioral, or exercise interventions that focused on obesity and related cardiometabolic risk factors.

Data Extraction: We undertook a qualitative “review of reviews” focusing on nonpharmacologic interventions for obesity and related cardiometabolic risk factors.

Results: Effects of interventions in the general population were meaningful but generally modest. Specific elements of diet, exercise, and behavioral therapy produced larger effects. Additionally, successful programs employed multiple components, personalization, longer duration, more frequent contact, and trained treatment providers. Interventions addressing these risk factors in people with serious mental illness typically incorporated some, but not all, of the elements demonstrated to be effective in general medical populations.

Conclusions: Studies from the general medical literature demonstrate considerable promise in addressing lifestyle risk factors. Existing programs will require tailoring to address the needs of those with serious mental illness and may be harder to implement given the challenges faced by this population. However, successful lifestyle interventions for those with serious mental illness can make a significant impact on the health and well-being of this vulnerable population and may inform future strategies for other underserved groups.


Mental health care
Somatic health care
Exercise
Exercise
Exercise

META-ANALYSIS

# Physical Activity Interventions for People With Mental Illness: A Systematic Review and Meta-Analysis

*Simon Rosenbaum, BSc; Anne Tiedemann, BSc, PhD; Catherine Sherrington, BAppSc(Physio), MPH, PhD; Jackie Curtis, MBBS; and Philip B. Ward, BMedSci, PhD*

*J Clin Psychiatry*

***Results:*** Thirty-nine eligible trials were identified. The primary meta-analysis found a large effect of physical activity on depressive symptoms (n = 20; standardized mean difference (SMD) = 0.80). The effect size in trial interventions that met ACSM guidelines for aerobic exercise did not differ significantly from those that did not meet these guidelines. The effect for trials with higher methodological quality was smaller than that observed for trials with lower methodological quality (SMD = 0.39 vs 1.35); however, the difference was not statistically significant. A large effect was found for schizophrenia symptoms (SMD = 1.0), a small effect was found for anthropometry (SMD = 0.24), and moderate effects were found for aerobic capacity (SMD = 0.63) and quality of life (SMD = 0.64).

***Conclusions:*** Physical activity reduced depressive symptoms in people with mental illness. Larger effects were seen in studies of poorer methodological quality. Physical activity reduced symptoms of schizophrenia and improved anthropometric measures, aerobic capacity, and quality of life among people with mental illness.

4 Isbell H, Chrusciel TL. Dependence liability of "non-narcotic" drugs. *Bull World Health Organ* 1970; **43:** 5–111.

5 Global Commission on Drug Policy. *Report of the Global Commission on Drug Policy* 2011. http://www.globalcommissionondrugs.org/wp-content/themes/gcdp_v1/pdf/Global_Commission_Report_English.pdf (accessed Feb 1, 2015).

## Why moving more should be promoted for severe mental illness

In their August 2014 Editorial, *The Lancet Psychiatry*[1] called for investigation into the best way to deliver exercise interventions in the multidisciplinary management of people with severe mental illness. We concur that the most important challenge to the effectiveness of exercise is adherence. We therefore advocate that the focus in this debate should not be on the most ideal dose–response (ie, efficacy), but on how people with severe mental illness might include such changes in their daily lives (ie, effectiveness).

Exercise is not a one-size-fits-all intervention.[2] Symptoms, previous exercise history, motivation, and access to services all effect the modality and intensity of exercise that individuals will undertake.[3] Inexperience with intense physical effort, associated fatigue and discomfort, increased risk of physical injuries, poor availability of exercise facilities and specialised equipment, and cost associated with access to facilities or training can all act as barriers for moderate to vigorous exercise.[3] For others, this type of activity might be ideal, supporting the need for access to trained clinicians with expertise in exercise prescription and psychopathology.

We advocate that individuals who are unable or unwilling to meet the goal of 150 min of moderate physical activity could still benefit from engaging in some physical activity. Findings of a 2013 meta-analysis[4] of studies of the general population suggested that risk for premature mortality significantly increases when adults sit for more than 7 h a day, indicating that recommendations should be as broad as possible. Therefore, people with severe mental illness should be advised to sit less and to break up sitting time throughout the day rather than focusing on compliance with general population guidelines. Health-care professionals should take immediate action and advise patients to sit less and move more. For example, people with severe mental illness might be advised to reduce prolonged sitting by standing or strolling for 1–2 min at least once an hour. Advice on how to accumulate time spent in light physical activity could include getting up from the chair and moving around during television commercial breaks, or adding 5 min walks throughout the day, for example walking short distances rather than using motorised transport.

Although seemingly trivial, adopting small, incremental lifestyle changes can better position sedentary people with severe mental illness to transition to brief bouts of moderate intensity exercise.[5] Such an approach will not be constrained by socioeconomic, environmental, and organisational barriers. Implementation of such interventions requires a shift in culture and system reform, from the design of mental health facilities through to changing staff attitudes. At a minimum, mental health professionals should briefly assess current exercise behaviours at every consultation, and discuss realistic and specific goals that could be adopted, with support and follow-up. Changes in physical and mental health parameters can then be monitored.

Health recommendations for the general population should not be discarded, but reframed as aspirational goals. Small incremental improvements—sitting less and moving more—constitute real-world interventions to improve the health of people with severe mental illness.

We declare no competing interests.

*Davy Vancampfort, Brendon Stubbs, Philip B Ward, Scott Teasdale, Simon Rosenbaum

**davy.vancampfort@uc-kortenberg.be**

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1 The Lancet Psychiatry. Physical and mental health: activate and integrate. *Lancet Psychiatry* 2014; **1:** 163.

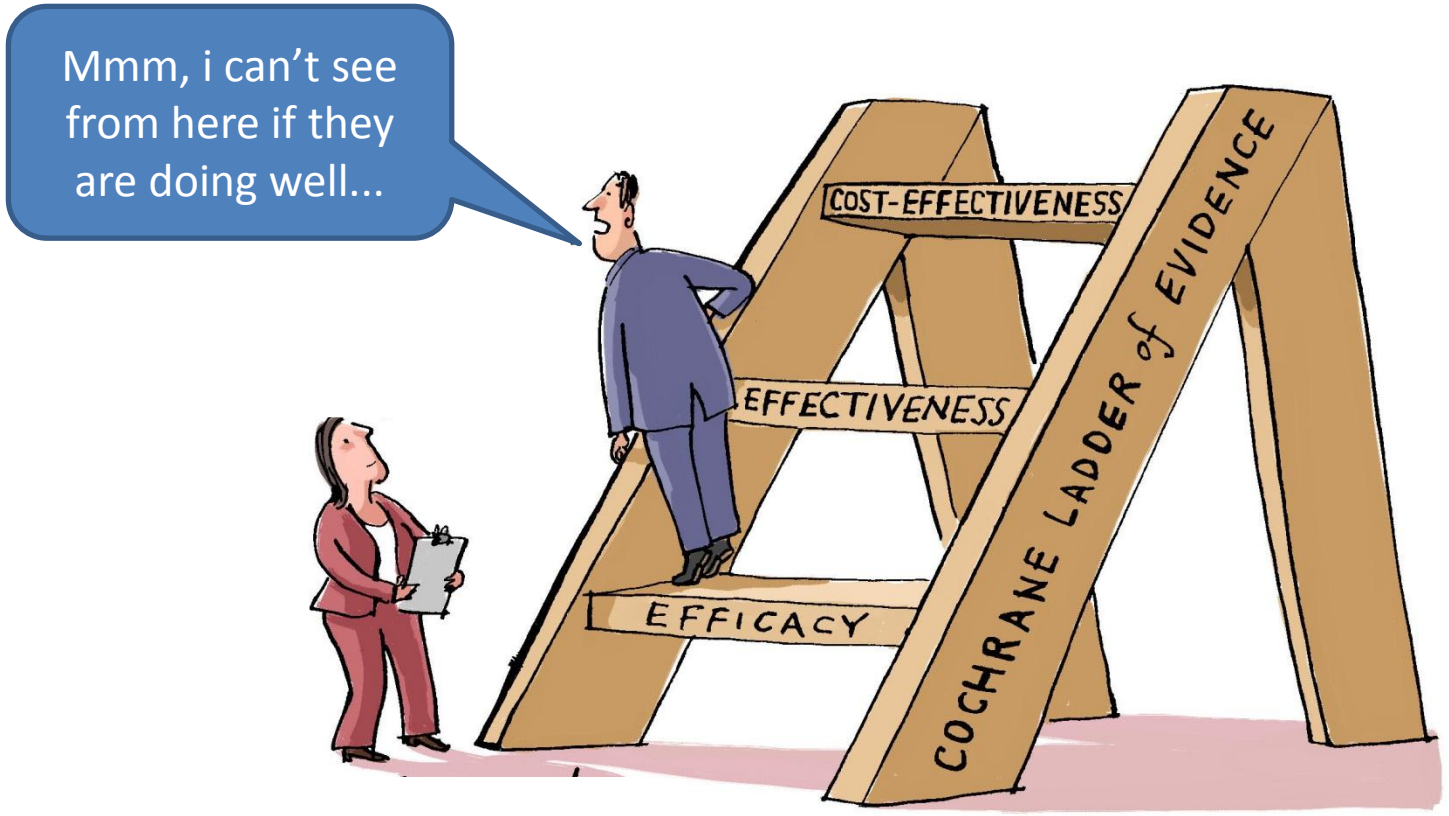
2 de Souto Barreto P. Global health agenda on non-communicable diseases: has WHO set a smart goal for physical activity? *BMJ* 2015; **350:** h23.

3 Vancampfort D, Knapen J, Probst M, Scheewe T, Remans S, De Hert M. A systematic review of correlates of physical activity in patients with schizophrenia. *Acta Psychiatrica Scandinavica* 2012; **125:** 352–62.

4 Chau JY, Grunseit AC, Chey T, et al. Daily sitting time and all-cause mortality: a meta-analysis. *PLoS One* 2013; **8:** e80000.

5 Vancampfort D, De Hert M, Vansteenkiste M, et al. The importance of self-determined motivation towards physical activity in patients with schizophrenia. *Psychiatry Research* 2013; **210:** 812–18.

**Not the efficacy (dose-response), but the effectiveness of physical activity (how people with severe mental illness might include lifestyle changes in their daily lives) should be the next step in future research …**



**Why ?**


"Refusing to go to the gym is not the same thing as resistance training."

# How motivating people with severe mental illness for lifestyle changes in their daily lives?


| | | |
|---|---|---|
| 15 | ● | $1 Million |
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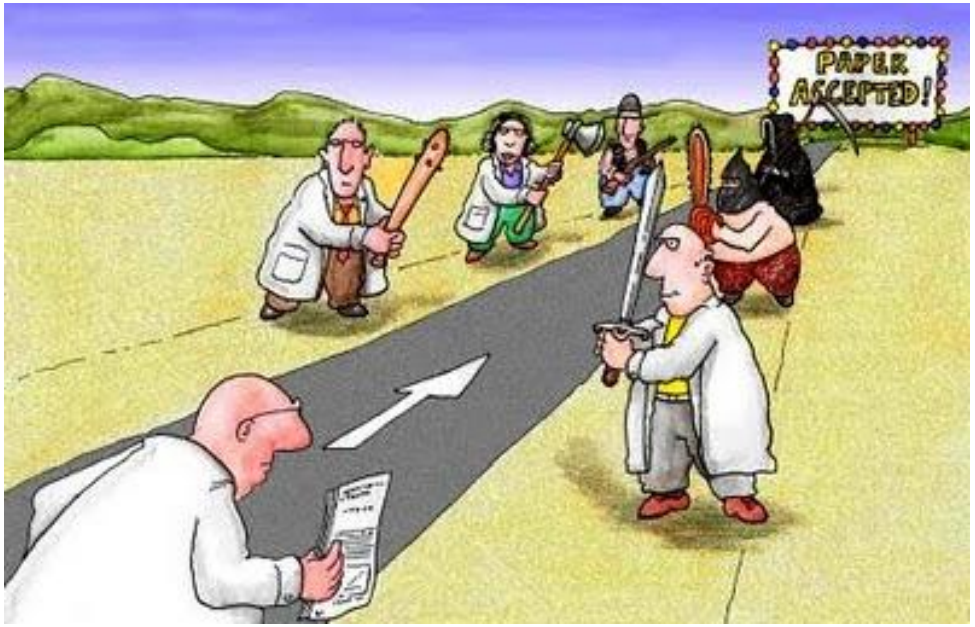
| 5 | ● | $1,000 |
| 4 | ● | $500 |
| 3 | ● | $300 |
| 2 | ● | $200 |
| 1 | ● | $100 |


This way
That way
over there
over yonder
over here


PAPER ACCEPTED!

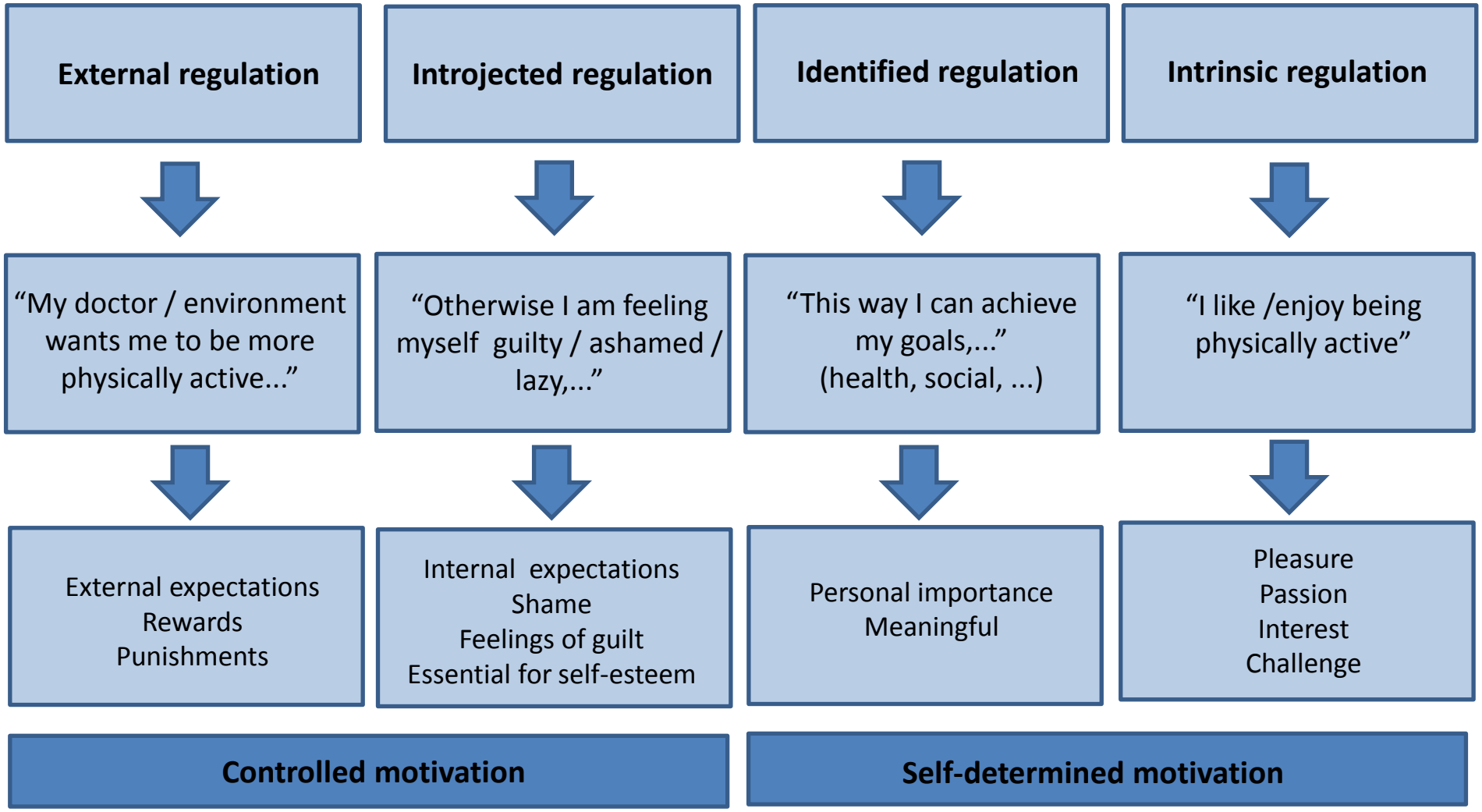
## Introduction
### Aims

**<u>Our study (in preparation) had two major aims.</u>**

1. We investigated if **motivational types** as formulated by the the self determination theory differ across the stages of change of the transtheoretical model.
2. A secondary aim was to examine **differences** in types of motivation across distinct groups: schizophrenia versus major depression versus bipolar disorder, male versus female patients, low versus high educated patients, in inpatients versus outpatients.

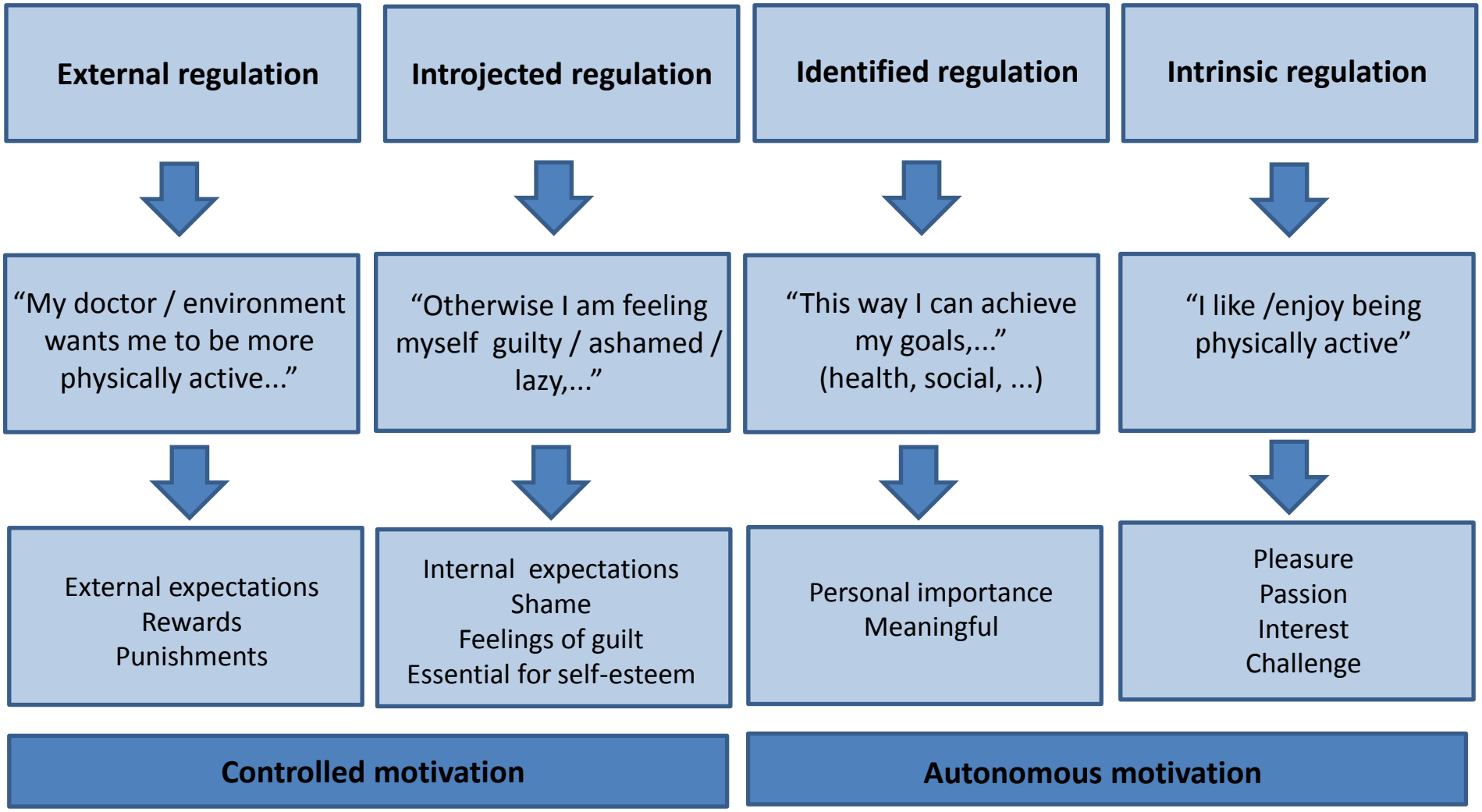
# The self-determination theory

**Why are we physically active?**



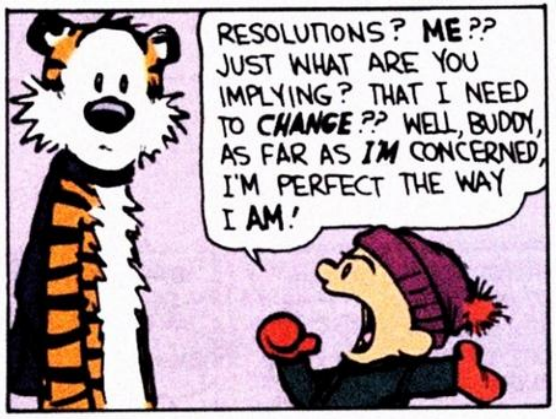
# The self-determination theory

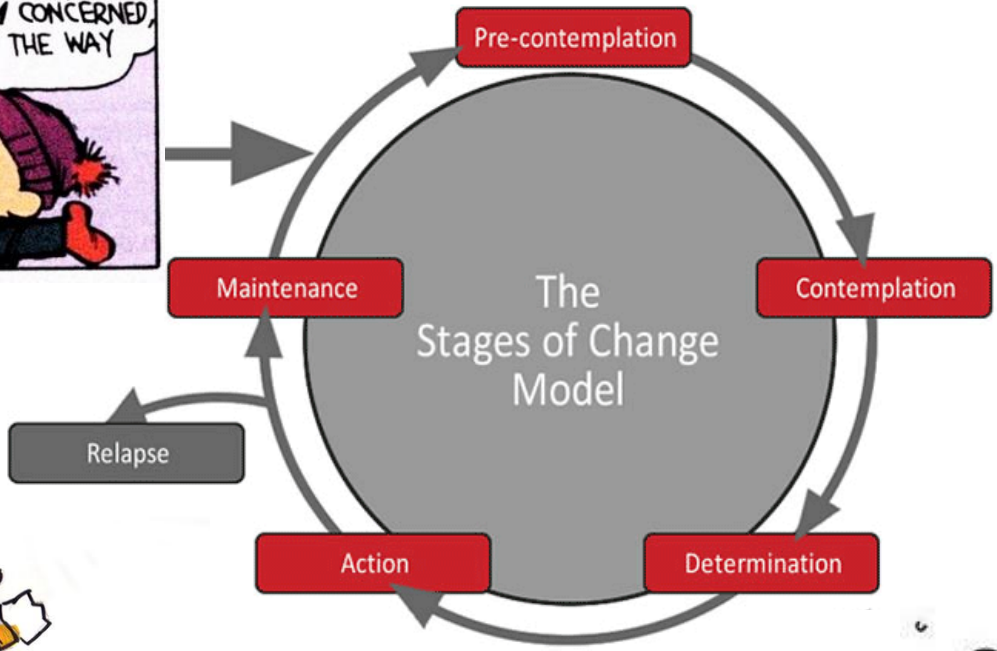
**Why are we physically active?**



# Readiness to change

## Transtheoretical model of change (Prochascka & DiClemente, 1993)



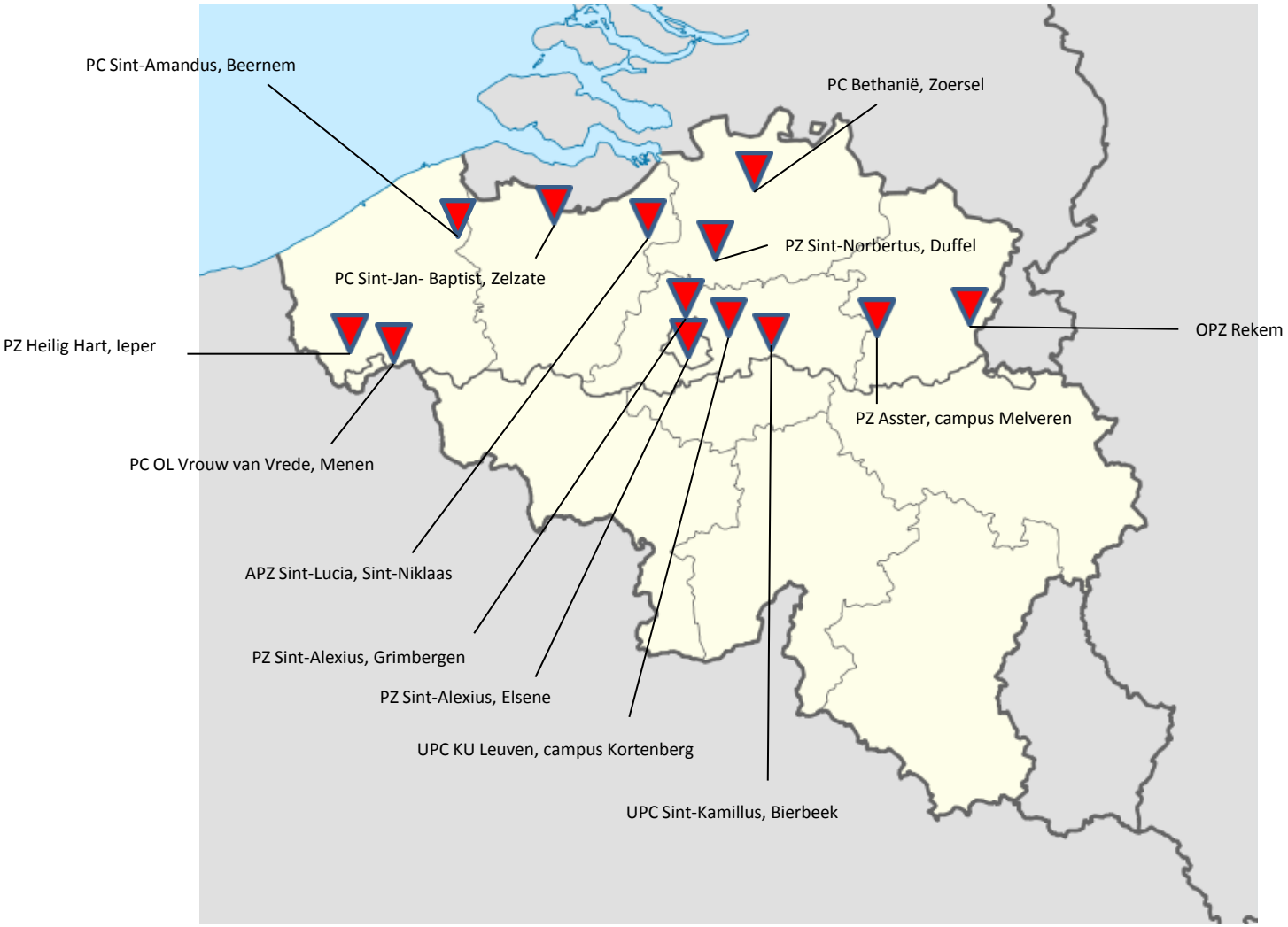


# Methods

## Inclusion criteria

- **In- and outpatients with a DSM-IV** diagnosis of schizophrenia / major depression disorder / bipolar disorder (American Psychiatric Association, 2000): the diagnosis was established by experienced psychiatrists responsible for the patients' treatment.
- **Psychiatrically stable on current psychotropic regimen** for at least **4 weeks**.
- Only patients with a **clinical global impression severity scale** (Guy, 1976) **score of 3 or less** assessed by a trained psychiatrist during a semi-structured interview: be able to concentrate for +- 20 min.

# Methods
## Participating centers



# Methods

## Materials

- **Physical Activity Stages of Change—Questionnaire:**

For each of the following questions, please circle Yes or No. Please be sure to read the questions carefully.

Physical activity or exercise includes activities such as walking briskly, jogging, bicycling, swimming, or any other activity in which the exertion is at least as intense as these activities.

1) I am currently physically active. **NO** **YES**

2) I intend to become more physically active in the next 6 months. **NO** **YES**

For activity to be regular, it must add up to a total of 30 minutes or more per day and be done at least 5 days per week. For example, you could take one 30-minute walk or take three 10-minute walks for a daily total of 30 minutes.

3) I currently engage in regular physical activity. **NO** **YES**

4) I have been regularly physically active for the past 6 months. **NO** **YES**

**Scoring Algorithm:**

| | |
|---|---|
| Precontemplation: | Question One = No; Question Two = No |
| Contemplation: | Question One = No; Question Two = Yes |
| Preparation: | Question One =Yes and Question Three = No |
| Action: | Question One = Yes; Question Three = Yes; and Question Four = No |
| Maintenance: | Question One = Yes; Question Three = Yes; Question Four = Yes |

Adapted from Marcus, Rossi et al., 1992.

# Methods
## Materials

- **<u>Behavioral Regulation in Exercise Questionnaire-2 :</u>**
  - We **adapted** the BREQ-2 by replacing the term “exercise” with the term “physical activity”: physical activity recommendations refer to all physical activities and not to exercise in particular which is only one part of physical activity.

# Results

## Participants (n=294)

| Variables | Mean±SD or number (%) |
|---|---|
| Age (years) | 43.6±13.6 |
| BMI | 26.2±4.9 |
| Schizophrenia | 129 (43,9%) |
| Bipolar disorder | 69 (23,5%) |
| Major depressive disorder | 96 (32,6%) |
| Outpatients | 68 (55,7%) |
| Lower education | 186 (63,3%) |
| Total walking time (min/week) | 173.0±145.4 |
| Total moderate physical activity time (min/week) | 81.4±113.0 |
| Total vigorous physical activity time (min/week) | 37.2±71.0 |

# Results

**Table.** Means and standard deviations and differences in the BREQ-2 subscales by stage of change

| Motivational type | Precontemplation (n=11) | | Contemplation (n=41) | | Preparation (n=60) | | Action (n=72) | | Maintenance (n=110) | | F-value | p-value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M | SD | M | SD | M | SD | M | SD | M | SD | | |
| Amotivation | 1.9[b,c,d] | 0.9 | 1.2[e,f,g] | 1.1 | 0.8[b,e,i] | 0.7 | 0.4[c,f] | 0.6 | 0.2[d,g,i] | 0.4 | 31.3 | <0.001* |
| External regulation | 1.3[d] | 1.3 | 1.3 | 1.0 | 1.0 | 0.9 | 0.9 | 0.9 | 0.6[d] | 0.9 | 4.6 | 0.001* |
| Introjected regulation | 0.8 | 1.0 | 1.5 | 1.0 | 1.6 | 1.1 | 1.3 | 1.0 | 1.1[d] | 1.0 | 2.7 | 0.031* |
| Identified regulation | 1.4[c,d] | 0.7 | 2.0[f,g] | 1.0 | 2.0[i] | 0.9 | 2.7[c,f] | 0.9 | 3.0[d,g,i] | 0.7 | 26.6 | <0.001* |
| Intrinsic regulation | 1.3[c,d] | 1.0 | 1.8[f,g] | 0.8 | 1.9 | 0.9 | 2.8[c,f,j] | 0.8 | 3.2[d,g,i,j] | 0.7 | 46.5 | <0.001* |

MANOVA (*model significant at $p<0.05$) with post hoc Scheffe when indicated (significance set here at $p<0.05$),Df=degrees of freedom (between groups; within groups), M=mean, SD=standard deviation, a=precontemplation versus contemplation, b=precontemplation versus preparation, c=precontemplation versus action, d=precontemplation versus maintenance, e=contemplation versus preparation, f=contemplation versus action, g=contemplation versus maintenance, h=preparation versus action, i=preparation versus maintenance, j=action versus maintenance.

# Results
## Differences between groups

- There were **<u>no</u> significant differences in motivation**:
  - between different diagnostic groups
  - between men and women
  - between in- and outpatients
  - between higher and lower educated persons

Indicating that all need the same care!

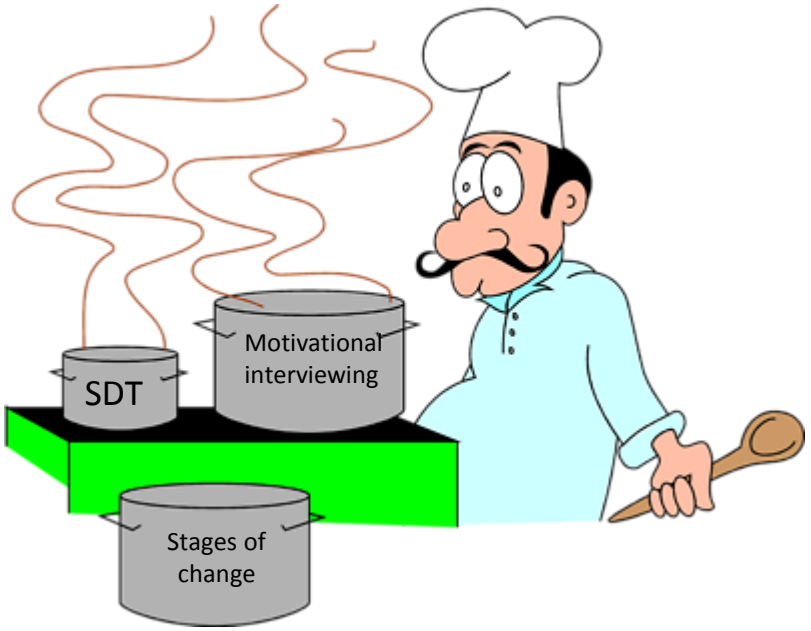
## What are now the practical implications for physical therapists?

*"There is nothing more practical than a good theory."*

Kurt Lewin
1952

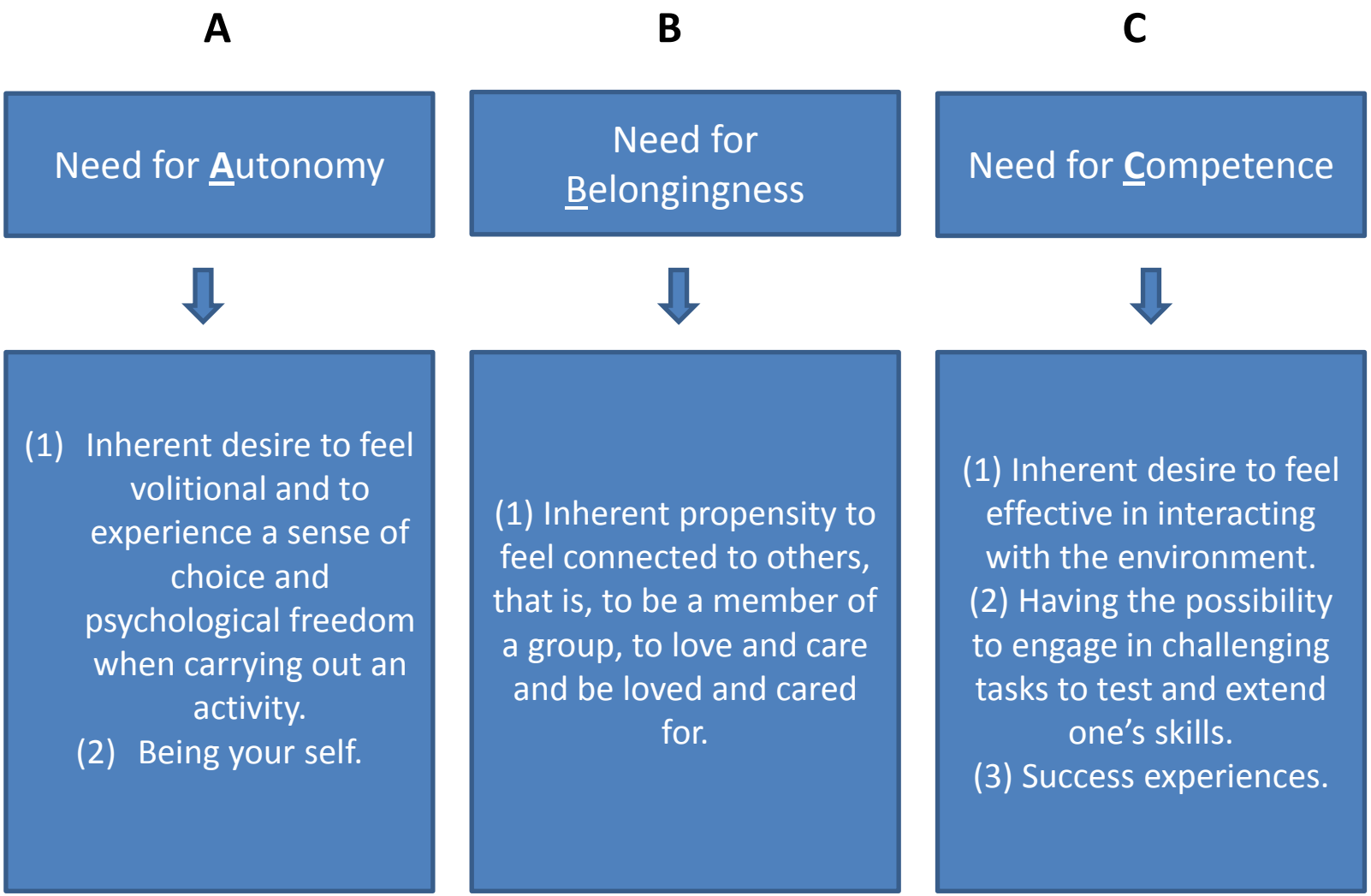
# What are now the practical implications for physical therapists?

- There are no detailled recipes that do guarantee a succesfull outcome.
- The ingredients are however known now: it’s up to the physical therapists to use them in an appropriate way.



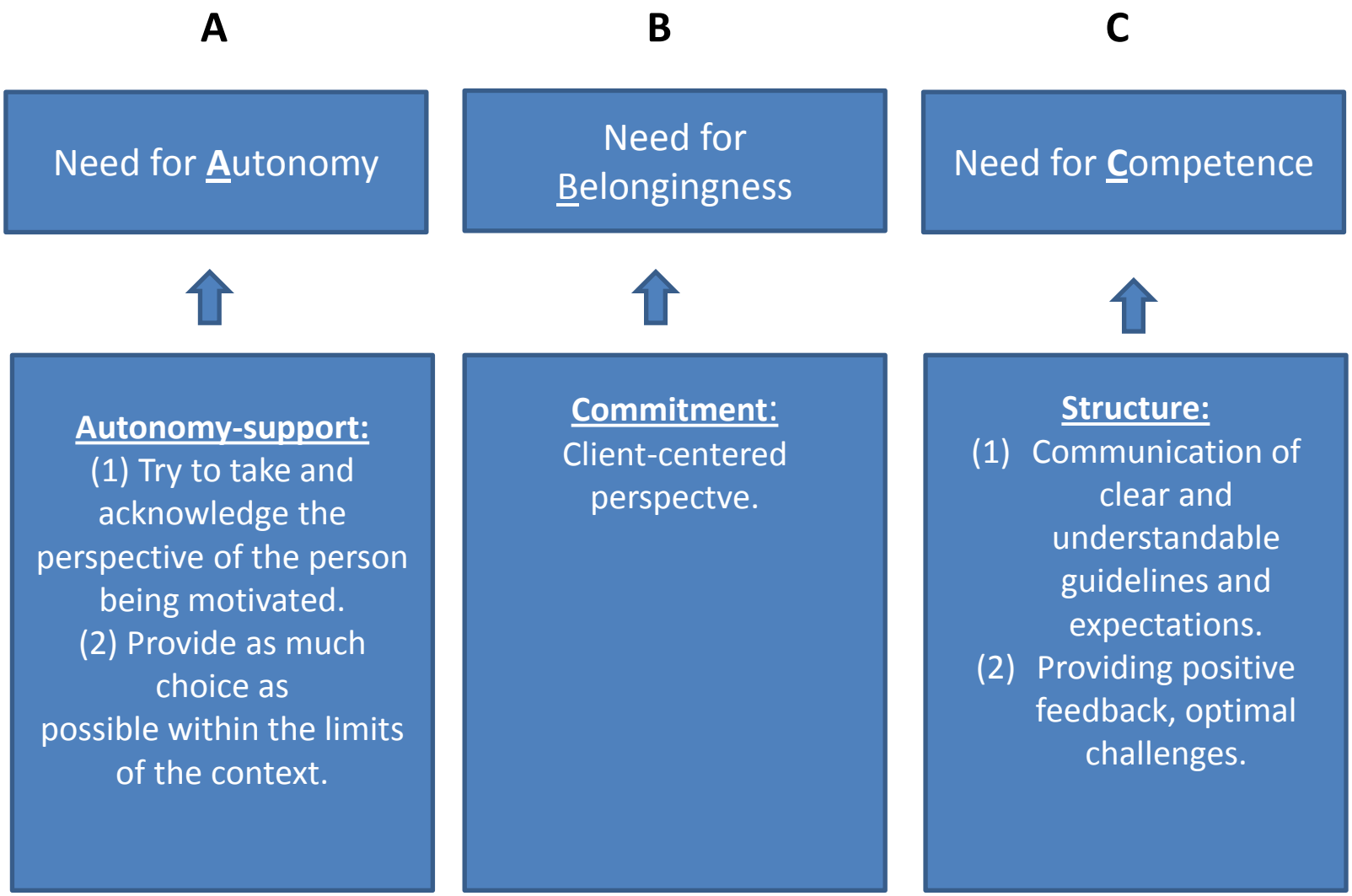
# Practical implications

## Need-supportive coaching



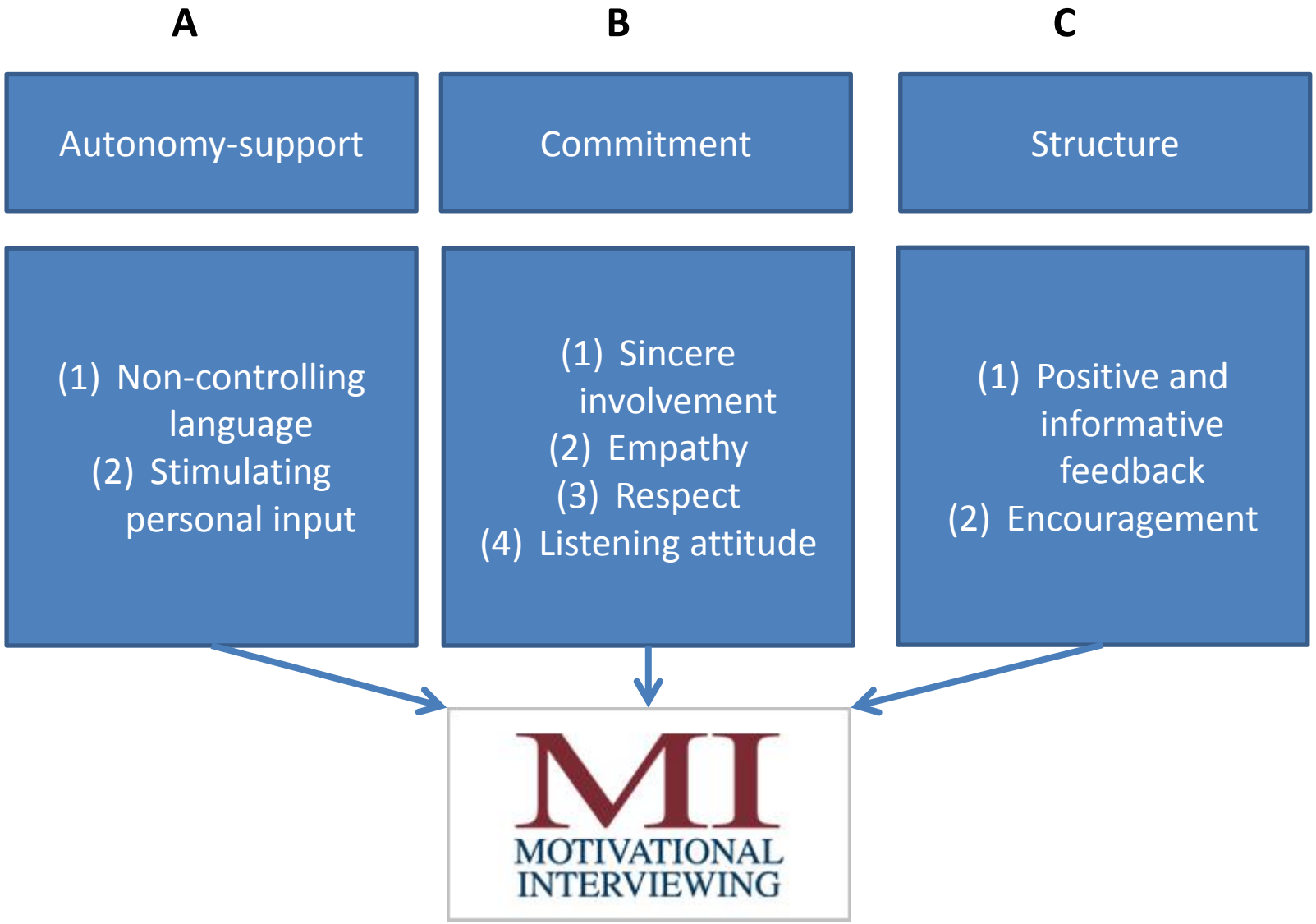
# Practical implications

## Need-supportive coaching



# Practical implications

## Need-supportive coaching



Vansteenkiste et al. International Journal of Behavioral Nutrition and Physical Activity 2012, 9:23
http://www.ijbnpa.org/content/9/1/23

INTERNATIONAL JOURNAL OF BEHAVIORAL NUTRITION AND PHYSICAL ACTIVITY

METHODOLOGY Open Access

# Toward systematic integration between Self-Determination Theory and Motivational Interviewing as examples of top-down and bottom-up intervention development: Autonomy or volition as a fundamental theoretical principle

Maarten Vansteenkiste[1*], Geoffrey C Williams[2] and Ken Resnicow[3]

Miller and Rollnick International Journal of Behavioral Nutrition and Physical Activity 2012, 9:25
http://www.ijbnpa.org/content/9/1/25

INTERNATIONAL JOURNAL OF BEHAVIORAL NUTRITION AND PHYSICAL ACTIVITY

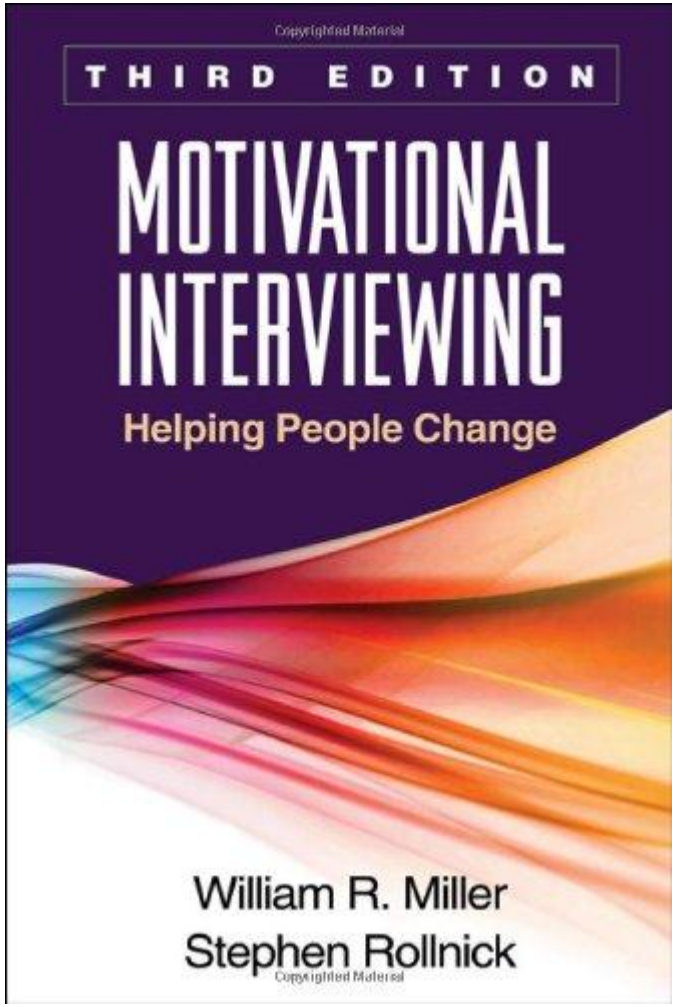
COMMENTARY Open Access

# Meeting in the middle: motivational interviewing and self-determination theory

William R Miller[1] and Stephen Rollnick[2*]

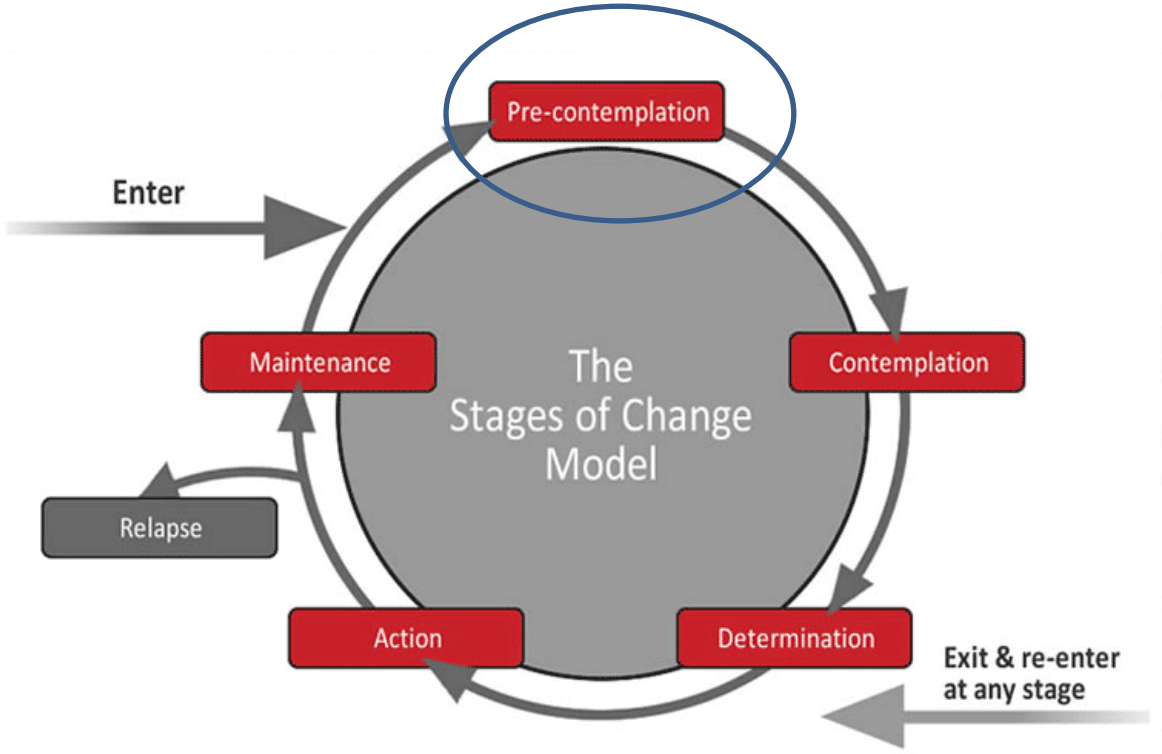
**Autonomously motivating means :**

a person-centered counseling style for addressing the common problem of ambivalence about change by paying particular attention to the language of change.



# Practical implications

## Applying the stages of change

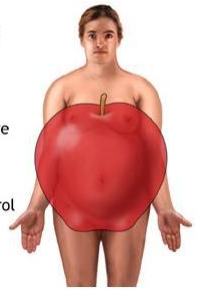


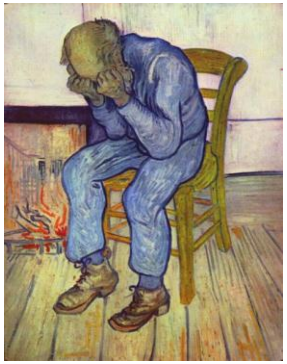
# Practical implications
## Applying the stages of change

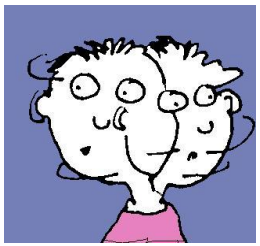
- The individual needs information on the problems and its consequences.
- Empathy, validation and encouragement are necessary throughout the intervention but especially when people with schizophrenia struggle with amotivation and with ambivalence and doubt their ability to accomplish any changes.

Metabolic syndrome
(Syndrome X)

- Central obesity
- High blood pressure
- High triglycerides
- Low HDL-cholesterol
- Insulin resistance



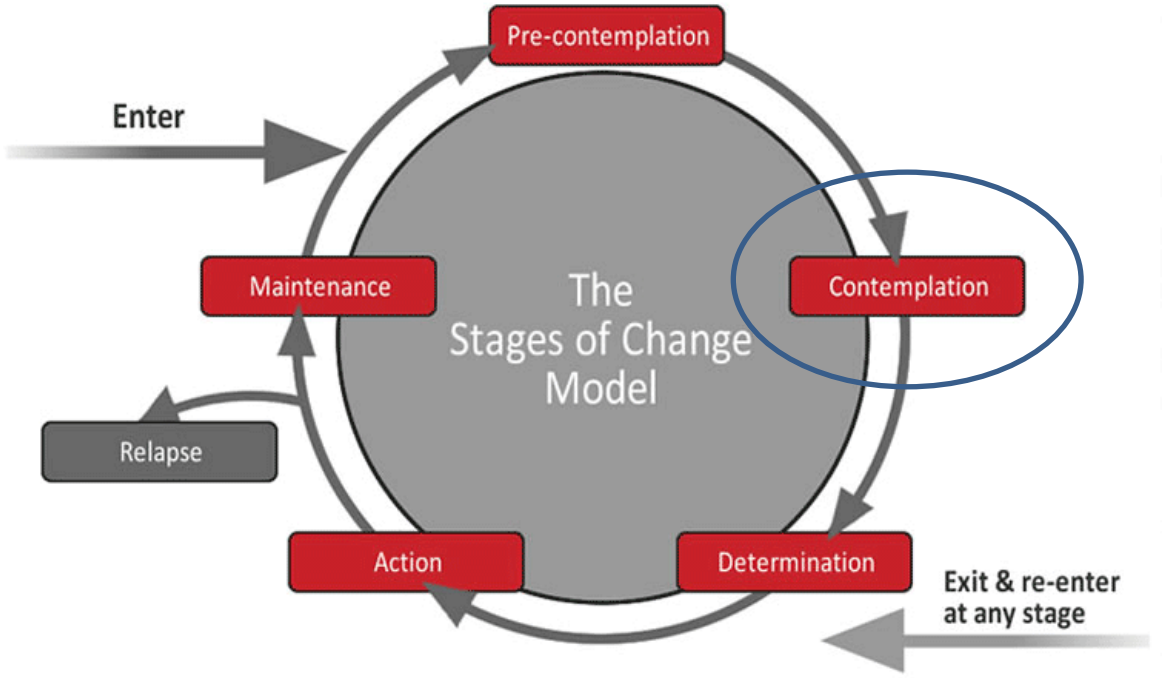




Vancampfort D, et al. A systematic review of correlates of physical activity in patients with schizophrenia. Acta Psychiatr Scand. 2012;125(5):352-62.

# Practical implications

## Applying the stages of change



# Practical implications

## Applying the stages of change

Advantages of changing

Disadvantages of not changing

Advantages of  not changing

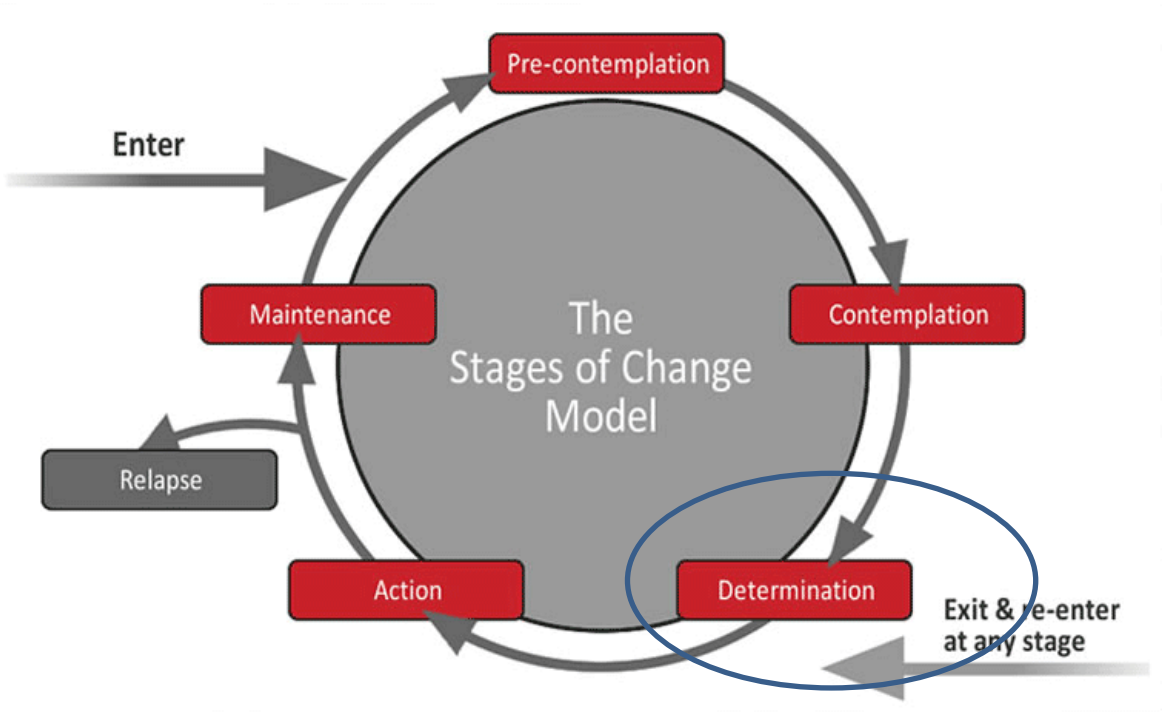
Disadvantages of changing

**1. strenghtening the person's self-efficacy (exploring strengths).**

**2. The person needs information about treatment options.**

# Practical implications

## Applying the stages of change



# Practical implications

## Applying the stages of change

**Step 1: Self- assessment**

Physical Activity Readiness Questionnaire - PAR-Q (revised 2002)

# PAR-Q & YOU

**(A Questionnaire for People Aged 15 to 69)**

Regular physical activity is fun and healthy, and increasingly more people are starting to become more active every day. Being more active is very safe for most people. However, some people should check with their doctor before they start becoming much more physically active.

If you are planning to become much more physically active than you are now, start by answering the seven questions in the box below. If you are between the ages of 15 and 69, the PAR-Q will tell you if you should check with your doctor before you start. If you are over 69 years of age, and you are not used to being very active, check with your doctor.

Common sense is your best guide when you answer these questions. Please read the questions carefully and answer each one honestly: check YES or NO.

| YES | NO | | |
|---|---|---|---|
| ☐ | ☐ | 1. | **Has your doctor ever said that you have a heart condition and that you should only do physical activity recommended by a doctor?** |
| ☐ | ☐ | 2. | **Do you feel pain in your chest when you do physical activity?** |
| ☐ | ☐ | 3. | **In the past month, have you had chest pain when you were not doing physical activity?** |
| ☐ | ☐ | 4. | **Do you lose your balance because of dizziness or do you ever lose consciousness?** |
| ☐ | ☐ | 5. | **Do you have a bone or joint problem (for example, back, knee or hip) that could be made worse by a change in your physical activity?** |
| ☐ | ☐ | 6. | **Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?** |
| ☐ | ☐ | 7. | **Do you know of any other reason why you should not do physical activity?** |

**If you answered**

**YES to one or more questions**

Talk with your doctor by phone or in person BEFORE you start becoming much more physically active or BEFORE you have a fitness appraisal. Tell your doctor about the PAR-Q and which questions you answered YES.

- You may be able to do any activity you want — as long as you start slowly and build up gradually. Or, you may need to restrict your activities to those which are safe for you. Talk with your doctor about the kinds of activities you wish to participate in and follow his/her advice.
- Find out which community programs are safe and helpful for you.

**NO to all questions**

If you answered NO honestly to all PAR-Q questions, you can be reasonably sure that you can:

- start becoming much more physically active – begin slowly and build up gradually. This is the safest and easiest way to go.
- take part in a fitness appraisal – this is an excellent way to determine your basic fitness so that you can plan the best way for you to live actively. It is also highly recommended that you have your blood pressure evaluated. If your reading is over 144/94, talk with your doctor before you start becoming much more physically active.

**DELAY BECOMING MUCH MORE ACTIVE:**

- if you are not feeling well because of a temporary illness such as a cold or a fever – wait until you feel better; or
- if you are or may be pregnant – talk to your doctor before you start becoming more active.

**PLEASE NOTE:** If your health changes so that you then answer YES to any of the above questions, tell your fitness or health professional. Ask whether you should change your physical activity plan.

Informed Use of the PAR-Q: The Canadian Society for Exercise Physiology, Health Canada, and their agents assume no liability for persons who undertake physical activity, and if in doubt after completing this questionnaire, consult your doctor prior to physical activity.

**No changes permitted. You are encouraged to photocopy the PAR-Q but only if you use the entire form.**

NOTE: If the PAR-Q is being given to a person before he or she participates in a physical activity program or a fitness appraisal, this section may be used for legal or administrative purposes.

"I have read, understood and completed this questionnaire. Any questions I had were answered to my full satisfaction."

NAME _____

SIGNATURE _____ DATE _____

SIGNATURE OF PARENT or GUARDIAN (for participants under the age of majority) _____ WITNESS _____

**Note: This physical activity clearance is valid for a maximum of 12 months from the date it is completed and becomes invalid if your condition changes so that you would answer YES to any of the seven questions.**



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1:12

continued on other side...

# Practical implications

## Applying the stages of change

| | PAR-Q | YES | NO |
|---|---|---|---|
| 1 | Has your Doctor ever said that you have a heart condition and that you should only do physical activity recommended by a Doctor? | | |
| 2 | Do you feel pain in your chest when you do physical activity? | | |
| 3 | In the past month, have you had chest pain when you were not doing physical activity? | | |
| 4 | Do you lose your balance because of dizziness or do you ever lose consciousness? | | |
| 5 | Do you have a bone or joint problem that could be made worse by a change in your physical activity? | | |
| 6 | Is your doctor currently prescribing drugs for your blood pressure or heart condition? | | |
| 7 | Do you have any other reason why you should not do physical activity? | | |

# Practical implications

## Applying the stages of change

**Step 2: Risk screening**

If the patient answers “yes” on 1 of the 7 questions of the PAR-Q ➞ proceed to a standardized screening.

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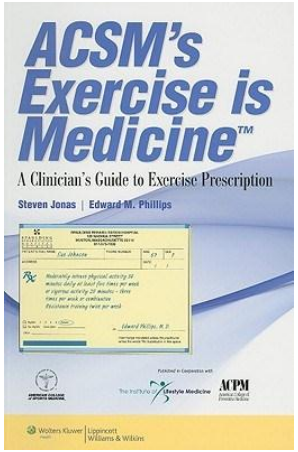
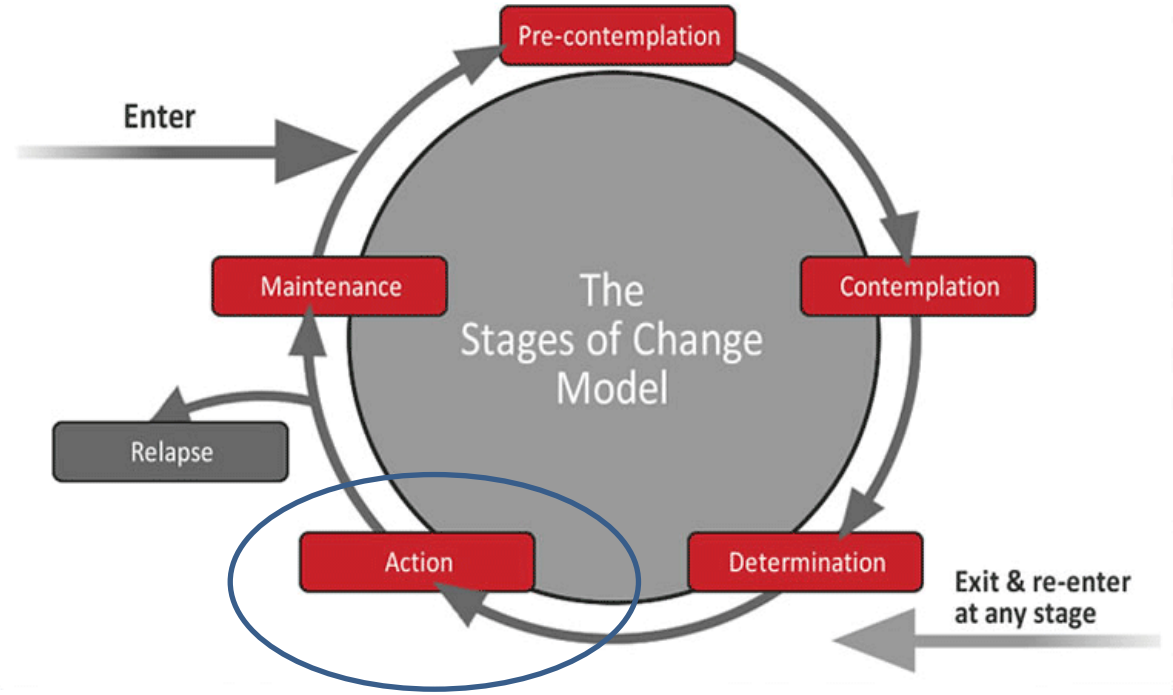
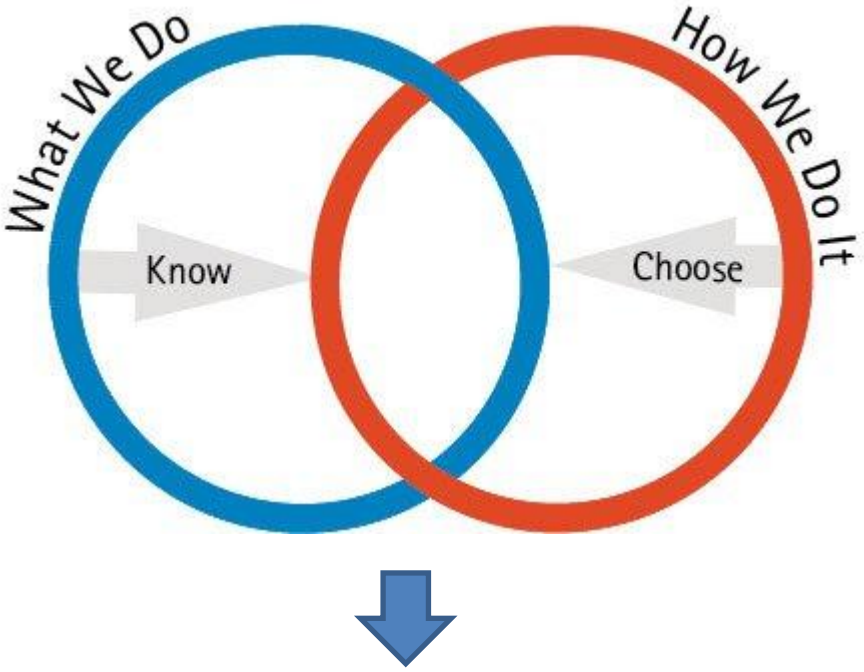


# Practical implications

## Applying the stages of change



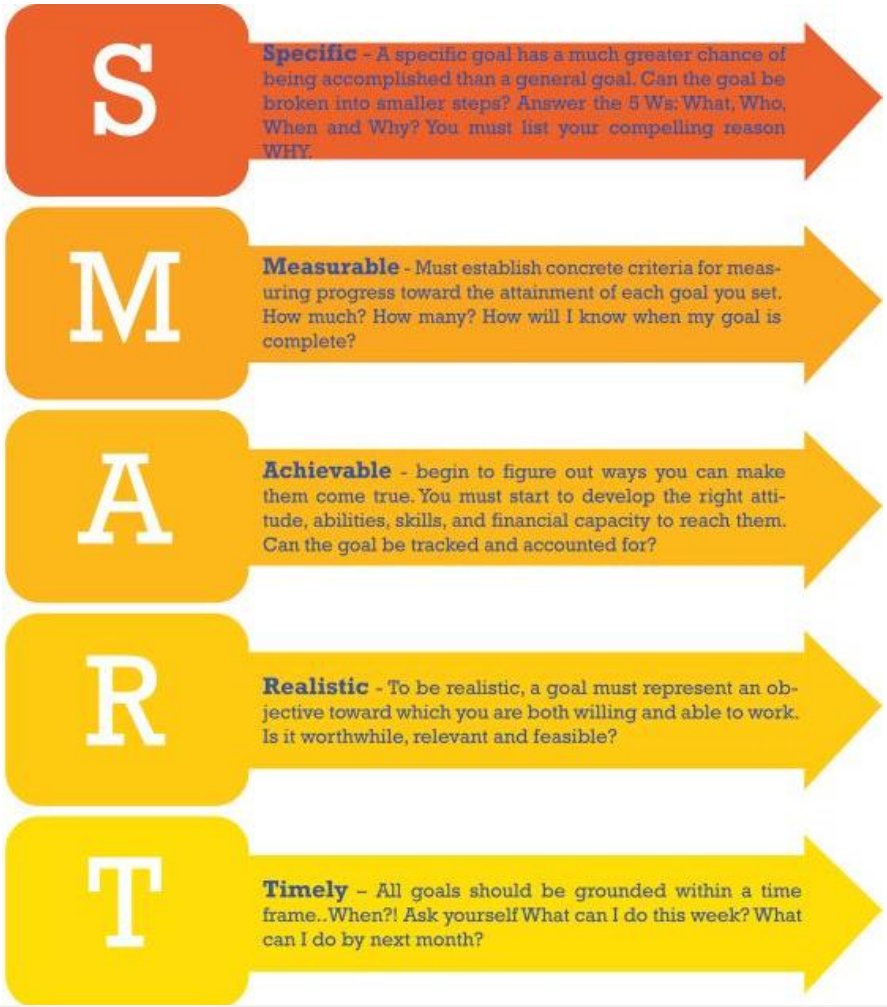
# Autonomously motivating in the action phase means : being SMARTER together




**An action plan**

## How to start...?

## BE ...

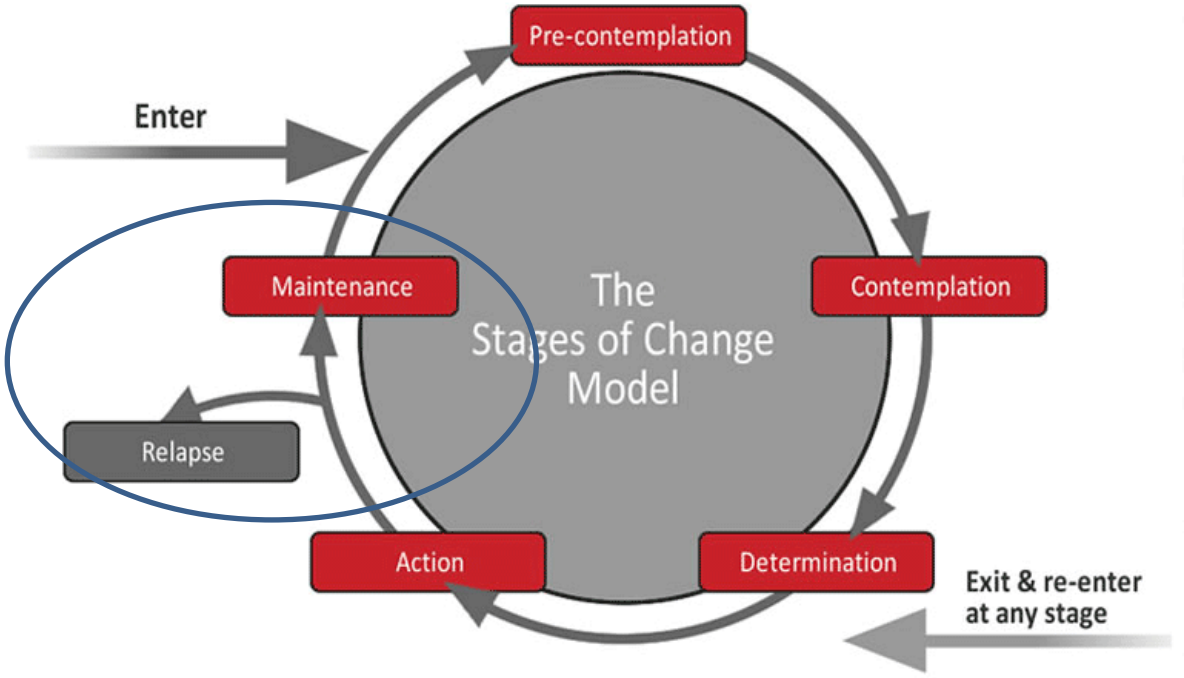


# Recommendations in the action phase

1. Create physical activity interventions based on the **person's current preferences and expectations**, the **initial cardiorespiratory fitness assessment** (or the measurement of perceived exertion during physical activity).
2. Assist in developing **an individual action plan taking into account emotional, cognitive and physical barriers** people with schizophrenia are confronted with.
3. Assist the person in setting **realistic and achievable goals** which lead to **success experiences**.
4. **Adapt** the moderate physical activity stimulus to the individual's health status and physical abilities, age, current fitness status, physical activity history, expectations and goals, side-effects of psychotropic medication, exercise tolerance and perceived exertion.
5. Use cognitive-behavioural strategies such as **self-monitoring, stimulus cuing, goal-setting and contracting**. For example, provide exercise cards and a logbook and use regular progress feedback.
6. Avoid between-peers comparisons but **stimulate enjoyable social interactions**.
7. Many people with schizophrenia will be focused on the distant outcomes, such as weight loss. Therefore, cardiorespiratory rehabilitation programs should also **emphasise the short-term benefits** after single sessions: improvements in mood and energy level and reductions in state anxiety, stress levels, distraction of negative thoughts, and the ability to concentrate and focus. Once participants begin to feel better as a result of their efforts, they are eager to continue. Exercise can give people with schizophrenia a sense of power over their recovery.
8. It is important to facilitate autonomous reasons for being physically active as much as possible by focusing on the **positive experiences of the activity itself, as well as helping to develop an identity of a physical active person**.
9. Once the person is active for **several weeks, healthcare professionals can start focusing on perceived cardiorespiratory fitness gains, achievement of personal goals and mastery experiences**.

# Practical implications

## Applying the stages of change



# Recommendations in the maintenance phase

1. **Follow-up** contact is very important: discuss problem-solving around barriers, reinforce all progress towards change (even if initially very small progress has been made) and encourage modification of goals if needed.
2. Seek **support of others such as family and friends**.
3. Use relapse behaviours/strategies: it is important to **explain** to persons with schizophrenia that relapses are part of the process of change and that responding with guilt, frustration and self-criticism may decrease their ability to maintain physical activity.
4. Relapse prevention strategies such as realistic goals setting, planned activity, realistic expectations, identifying and modifying negative thinking, and focusing on benefits of single exercise sessions seem to be effective.

**How to maintain...?**

**...and this will only work if... taking the stairs is... FUN**

Thank you!


"My doctor told me to increase my exercise program,
so I switched from not exercising three times
a week to not exercising six times a week."